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THE ROLE OF FAMILIES AND LANGUAGE SCHOOL TEACHERS IN SUPPORTING STUDENT LEARNING AND MAXIMISING ENGLISH LANGUAGE TEACHER EFFECTIVENESS IN HUNGARY, KAZAKHSTAN, AND POLAND: MIXED METHODS STUDIES

DOI ID: 10.15476/ELTE.2024.185

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Budapest, 2024

Abstract

This study investigates the effectiveness of language teachers and the role of families in online learning environments during crises, particularly focusing on the COVID-19 pandemic's impact on education in Hungary, Kazakhstan, and Poland. Employing a mixed method convergent parallel design, the research examines how educational technologies transform traditional language teaching, teacher effectiveness, and family engagement in supporting student learning. The theoretical frameworks of Danielson's Framework of Teaching (FfT), Technological Pedagogical Content Knowledge (TPACK), and the Community of Inquiry (CoI) guide the analysis, while Bourdieu's theory of capital, Bronfenbrenner's socio-ecological systems theory, and the Digital Divide concept offer perspectives on family support and socio-economic inequalities.

The findings reveal significant challenges in teacher preparedness for online pedagogy, highlighting gaps in technological knowledge and the exacerbation of educational inequalities due to the digital divide. The study emphasizes the importance of family involvement in sustaining student learning during lockdowns and identifies disparities in access to technology, particularly among low socio-economic status families. It calls for enhanced teacher training in digital pedagogy, equitable access to educational technologies, and policy reforms to ensure effective learning in future crises. The research offers valuable insights for educators, policymakers, and families, advocating for a more inclusive and technologically-savvy education system to address the challenges of remote learning. Accordingly, various recommendations to enhance teacher training in digital pedagogy and provide teaching and learning solutions, where context makes it available, in online learning environments in Hungary, Kazakhstan, and Poland were identified and formulated as policy proposals.

Keywords: language teacher education, student learning, family support, Hungary, Kazakhstan, Poland, mixed methods.

Acknowledgements

This dissertation celebrates the culmination of a deeply enriching academic journey and I am indebted to many individuals and institutions whose support has made this work possible.

First and foremost, I wish to express my heartfelt gratitude to my supervisors, Dr. Attila Varga and Dr. Kata Csizér for their unwavering guidance, supportive feedback, and constant encouragement throughout this research process. Their expertise and mentorship have been invaluable in shaping this dissertation and my growth as a researcher. I would also like to thank senior faculty members at the Doctoral School of Education, Prof Emeritus Gábor Halasz, Dr. Erika Kopp, and Dr. Helga Dorner for the encouragement, joy of writing, and positive attitude. Final words of gratitude go to my reviewers who have offered their insightful feedback on improving this work at the final stages of writing.

I am immensely grateful to the teachers, students, and families in Hungary, Kazakhstan, and Poland who generously participated in this study. Without their openness and willingness to share their experiences, this research would not have been possible.

I also extend my gratitude to my peers and colleagues in the Doctoral School of Education at Eötvös Loránd University for their support, camaraderie, and intellectual engagement, which provided me with a stimulating academic environment. Special thanks go to the administrative staff for their tireless efforts in ensuring the smooth progression of my doctoral studies**.**

I owe a special debt of gratitude to my family and friends, whose patience, understanding, and unwavering belief in me provided the foundation for this accomplishment. To my spouse, Ferenc, to my mother, Gulbarshin, to my in-laws, Katalin, Ferenc, and Péter, and to my brother, Askar, thank you for your love, encouragement, and endless support during this long and often challenging journey. To my children, Malina and Ádám, thank you for your boundless joy and for reminding me of the importance of perseverance.

Finally, I acknowledge the financial support of Stipendium Hungaricum which made it possible to carry out this research. This dissertation is as much a reflection of your contributions as it is of my work. Thank you all.

Dedication

I dedicate this work to an inquisitive mind who aspires to become a researcher. Whether you are little or experienced, be all ears and all eyes for they shall guide you to find the truth of your research.

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List of abbreviations

CALL: computer-assisted language learning

CEFR: Common European Framework of Reference for Languages

CMC: computer-mediated communication

CoI: Community of Inquiry

DL: distance learning

EdTech: educational technologies

EFL: English as a Foreign Language

ERE: emergent remote education

FfT: Framework for Teaching

LMS: learning management systems

MALL: mobile-assisted language learning

OL: online learning

OLEs: online learning environments

RL: remote learning

SES: socio-economic status

SL: student learning

TE: teacher effectiveness

TELL: technology-enabled language learning

TPACK: Technological Pedagogical and Content Knowledge

Chapter 1 Introduction

Overview

It is undoubtedly known that a teacher plays a crucial role in the quality of student's learning and educational results (Blömeke et al., 2022; Darling-Hammond et al., 2020). Equally, the quality of teachers, their professionalism and a degree of their professionalisation depends on the quality of teacher education clearly reflected in various European policy documents (EU Monitor, 2007). Addressing some of the issues mentioned above, this mixed method convergent parallel study aims to expand the current view of language teacher effectiveness by exploring how online learning environments and use of technologies for learning transform traditional views of language teaching. This study also aims to foster understanding of the roles of families involved in promoting student learning, especially in times of crisis.

To achieve these aims, the research adopts a comprehensive perspective to investigate the phenomena under question by integrating theoretical frameworks widely used in educational technology studies such as Danielson's Framework of Teaching (FfT) (2013), Technological Pedagogical and Content Knowledge (TPACK) (Mishra & Koehler, 2006), and the Community of Inquiry (CoI) (Garrison et al., 2000). These frameworks provide a solid theoretical foundation to study teacher effectiveness and student learning in online learning environments. Furthermore, I used Bourdieu's theory of (forms of) capital (1986), Bronfenbrenner's socio-ecological systems theory (1979), and the Digital Divide concept to explore the extent of family support for children in continuing learning during lockdowns prompted by the COVID-19 pandemic. The rapid and chaotic shift to emergent remote education (ERE) (Bozkurt & Sharma, 2020), characterised by disorganised schooling in home-based environments and a lack of teacher knowledge in online pedagogy, necessitates the selection of theoretical frameworks.

The structure of this dissertation is meticulously designed to guide the reader through a comprehensive exploration of the study's aim and context. Following this introduction, Chapter 2 delves into the theoretical framework underpinning the study, drawing on Danielson's Framework of Teaching (2013), TPACK (Mishra & Koehler, 2006), CoI (Garrison et al., 2000), Bronfenbrenner's socio-ecological systems theory (1979), Bourdieu's theory of capital (1986), and the Digital Divide. This theoretical grounding provides the lens through

which the study's findings can be interpreted and understood. Chapter 3 outlines the methodology, adopting a mixed method convergent parallel design which allows for a nuanced analysis and comparison of both quantitative and qualitative data. Chapter 4 presents the findings, synthesizing insights across the three countries to highlight commonalities and differences in teacher effectiveness, the role of families, and the impact of the digital divide. Finally, Chapter 5 discusses the implications of these findings for policy, practice, and future research, emphasizing the study's contribution to the field of online education and its potential to inform more effective and equitable educational practices in times of crisis.

This introductory chapter declares a purpose of this study (Section 1.1), outlines the background and rationale (Section 1.2), states a research problem and poses research questions (Section 1.3) followed by the significance of this study (Section 1.4).

1.1 Purpose of the Study

To restate, the primary aims of this mixed method convergent parallel study are twofold. First is to explore the phenomenon of language teacher effectiveness in online learning environments, a pressing issue given the global shift towards digital education. Second is to advance our understanding of the critical role of families in supporting student learning in home-based education in times of crisis such as the COVID-19 pandemic. This research is crucial addressing the urgent need to harness educational technologies (EdTech) for effective language teaching and learning in such unprecedented times as the COVID-19. The significance of these aims is underscored by the rapid and often chaotic shift to online learning globally which has, in turn, exposed significant gaps in our understanding of online pedagogy, the digital divide, and the roles families play in the educational process outside the traditional classroom setting.

1.2 Background and Rationale of the Study

Several studies explored teacher characteristics found to be successful involving students in digital learning. Recent research (Horváth, 2023) indicates that online teaching and learning is a complex issue requiring different teacher characteristics to be considered together. Aspects of selected pedagogical strategies and exhibited teacher behaviours control or support result differently in student's learning (Fernandez et al., 2022) in online settings. Present research investigates a distinct language teaching and learning situation and parental involvement contributing to student learning in times of crisis including many variables of interest specific to online learning environments.

Furthermore, the crisis such as the global COVID-19 pandemic amplified existing educational and digital inequalities globally. Recent study (Sosa Díaz, 2021) researching the

digital divide during the pandemic illustrated an urgent need to discuss the issues of equity and access to digital devices for remote teaching and learning purposes. Other studies illustrated teachers struggling with adjusting to remote education because of the lack of technological and pedagogical knowledge and understanding of the 21st century teaching contexts (Dindar et al., 2021; Fransson et al., 2019; Valtonen et al., 2017) in Hungary (Homoki & Nyitrai, 2022), Kazakhstan (Hajar & Manan, 2022a), and Poland (Jakubowski & Sitko-Dominik, 2021). Therefore, the current study can play an important role in addressing the issue of social inequality and exclusion, broadening our views on the changing nature of educational interactions, and social transformations in providing the right to good education for all.

Despite the challenges caused by the pandemic to families globally (e.g., Balenzano et al., 2020), parents worldwide differed in their perceptions of adjusting to new parenting styles discovered during the pandemic. Some studies documented families and children's emotions and feelings, fundamental in thinking and learning, in struggling with emergent remote education and coping with parental stress (Davis et al., 2021; Kim et al., 2021). Some other studies found families enjoying a large amount of time, re-exploring their family relationships, and valuing more time together (Balenzano et al., 2020; Cluver et al., 2020; Nielsen, 2020). These issues highlight an opportunity for further research to inform policymakers and all other involved school stakeholders about the provision of necessary resources in creating and maintaining a technologically-savvy and pedagogically-sound ecosystem for remote teaching and learning. Specifically, if issues similar to COVID arise (International Council of Educational Advisers Report, 2018-2020; World Health Organisation, 2018) schools and teachers need to be prepared and ready for academic continuity in the face of an emergency. Families and children should be able to understand the stakes and responsibility of learning remotely. Finally, policy makers and governments need to develop digital learning policies and frameworks to support schools and teachers in providing teaching and learning in emergency situations.

The selection of Hungary, Kazakhstan, and Poland as research contexts is based on their diverse educational landscapes and varying degrees of technological readiness, offering a rich comparative perspective on the issues at hand. These countries share a legacy of Soviet-style education systems but have followed distinct paths towards integrating technology in education amidst economic and social transformations. Understanding the complexities of implementing online learning solutions and the impacts on teachers, students, and families within these specific educational contexts is essential for this research.

In response to the COVID-19, Hungary, Kazakhstan, and Poland, like many other countries in the world, approached the organisation and implementation of emergent remote education similarly. Homes and families became educational providers and partners for an extensive period of the pandemic (UNESCO, 2020). Families of low socio-economic status (SES) in rural areas struggled more with remote education and teachers lacked strong technological and pedagogical skills to carry out quality remote education (Rowe et al., 2020). These and other inadequacies in mitigating the challenges of the ERE for schools and families revealed wider gaps in societal and educational inequalities.

Methodologically, these research contexts- Hungary, Kazakhstan, and Poland- possessed some essential parameters to carry out the study. Because of my former school leadership and teaching experiences in Kazakhstan, I acquired solid knowledge of the educational landscape in the country. Inquiry about English language teachers', K-12 students', and families' remote education experiences offered an opportunity to investigate how the pandemic and associated with the pandemic digital means of providing and delivering education challenged traditional language teaching practices.

Given that I have started my doctoral studies and family life in Hungary, I felt connected to educational challenges appearing in this country. During the previous five years that I have spent in this country I have enriched my knowledge about English as a Foreign Language (EFL) education in this country and some striking challenges in school education. Culturally, Hungary and Kazakhstan share some similarities in the attitudes of families towards student learning. Yet, they differ from each other in the educational landscape. Investigating teacher effectiveness of EFL teachers in a monolingual country such as Hungary can contribute to the scholarship on solving educational equity issues that Hungary faces at present.

In contrast to Hungary, Poland appears to be an emerging country in using classroom-based educational technology in Europe. Similarly to Hungary, Poland uses one language of instruction in K-12. Therefore, Poland attracted my research interest as a country with rich technological advancements in K-12 language education and developed policies in teacher training. Being affected by recent educational reforms in secondary education, attractive PISA results since the 2000s, and aging teacher population, the educational context of Poland can benefit the study. In sum, carrying out this study in Hungary, Kazakhstan, and Poland contributed to research and practice from theoretical, methodological, and ontological viewpoints. Chapter 2 of this dissertation further details the reasons for selecting these countries as research contexts.

Among the unique challenges and successes that each research context experienced in this study in adapting to emergent remote education during the COVID-19 pandemic,

1.3 Problem Statement and Research Questions

The role of families and schoolteachers in supporting student learning and teacher effectiveness is a critical issue in Hungary, Kazakhstan, and Poland today. Both major issues that have emerged recently with a teaching profession in these countries (for Hungary, see: Directorate-General for Economic and Financial Affairs, 2023; European Commission, 2020, p.32; Öveges & Csizér, 2018; for Kazakhstan, see: Courtney et al., 2023; Mukhametgaleyeva & Ospan, 2018; for Poland, see: Madalinska-Michalak, 2017, p.86) and the learning loss caused by the global pandemic COVID-19 (OECD, 2022) could impact the success or the failure of educational systems in these countries. In addition, an inadequate preparation and command of teacher technological pedagogical methodology among pre-service (Dringó-Horvath, 2018 as cited in Chrappán et al., 2020) and in-service teachers (Fekete, 2022; Öveges & Csizér, 2018), lack of technology planning in schools (Durrani et al., 2023), issues of equity and access to technologies (Bokayev et al., 2021; Plebańska, 2017; Tomczyk & Walker, 2021) have been reported as some of the issues that teachers in Hungary, Kazakhstan, and Poland have been struggling with emergent remote education in 2020-2021.

More specifically, teachers' quality or teacher effectiveness as it is researched in this study, is under-researched in Hungary (for example, in connection with self-efficacy see Schleicher, 2011, p. 210), in Kazakhstan (Tajik et al., 2022; OECD/ The World Bank, 2015), and in Poland (Madalinska-Michalak & Bavli, 2018). Previous research studying teacher effectiveness (Burroughs et al., 2019) associated teacher experience, teacher professional knowledge, and teacher provision of opportunity to learn with higher student achievement. Additionally, we know from social cognitive theory that the relationships between teachers and students matter and contribute to student development. There are of course other factors at the level of teachers and schools that impact student achievement. However, this study focuses on the aspects of student learning in times of crisis such as the COVID-19 pandemic. Therefore, this study is designed to better understand the roles of, specifically, language teachers in continuing the provision of learning for students while being locked in homes in Hungary, Kazakhstan, and Poland during the global COVID-19 pandemic.

Another problem addressed in this study is a lack of understanding about the roles of families in supporting student learning during the pandemic. Data concerning how the role of families changed during forced remote education from home in Hungary (Csonka-Stambekova, 2021), Kazakhstan (Hajar & Manan, 2022b), and Poland (Bebel, 2022; Marchlik et al., 2021)

in English are limited. Some family-oriented studies (Giannotti et al., 2022; Johnson et al., 2021) explored the role of the home as an educational provider and the changing landscape of parental involvement in student learning around the world because of national lockdowns. In Hungary, Kazakhstan, and Poland though the phenomena remain understudied.

To help guide the study, the following research questions (RQs) have been developed and are detailed in Chapter 3:

RQ1: What is foreign language schoolteachers' strong and weak TPACK-21 as reported by teachers from Hungary, Kazakhstan, and Poland? (Technological Pedagogical and Content Knowledge)

RQ2: What is the relationship among social presence, teaching presence, and cognitive presence of the Community of Inquiry as reported by school students?

RQ3: What are school stakeholders' (secondary school foreign language teachers, students, parents, and educational technology experts) perceptions on the pedagogical use of technology in remote, i.e., online learning?

RQ4: How do school students, teachers, and families live through the shift in traditional boundaries in learning environments?

RQ5: What challenges did teachers experience in switching to an emergent remote teaching and learning?

Mixed methods question: To what extent, if any, did the combination of survey research, in-depth interviews and classroom observations provide a more comprehensive understanding of teachers' and families' roles in supporting students' learning and maximising teacher effectiveness in Hungary, Kazakhstan, and Poland?

1.4 Significance of the Study

Failing to critically examine, evaluate, and challenge the rising rates of the use of educational technologies and online learning platforms in language teaching makes it unclear for language educators and policy makers how to make pedagogical advantage of it on a broader scale. Specifically, the lack of evidence in research settings of this study, highlighted in the literature discussed above, increases the risk of viewing technologies as a passive supplement to classroom instruction. As a result, it may lead to growing teacher resistance in integrating technologies in teaching practices and may actually impact meaningfully on language teaching and learning in K-12 education. Furthermore, this study has emphasised that educational technology in teaching and learning encompasses pedagogical, socio-economic, and ethical dimensions that research and practice should be concerned about, i.e., ensuring

inclusion, equity and quality, preparing and empowering teachers to friend technologies for student learning enhancement.

This study contributes to language pedagogy, educational technology theories and to practices of language teachers in online settings during a crisis in so many ways. First, a core insight is a new theoretical framework of teacher effectiveness designed for online learning environments based on the empirical data. Because the study addresses the unknown phenomena in three countries, it brings theoretical references from teaching and learning domain, human development, sociology of education, and educational technology research studies. Second, the research design of this study is distinctive in the use of combining different research paradigms, different sources of data collection, analysis and integration. Methodologically speaking, this study uses innovative methods to illustrate an iterative nature of the research cycle and study results across research contexts. That is, the collection and analysis of online questionnaires, semi-structured interviews, and remote English lesson observations occurred in parallel with some time lapses in this study independently from each other (DeCuir-Gunby & Schultz, 2017; Teddlie & Tashakkori, 2009).

This research benefits language practitioners and school leadership, policy makers, and parents as it informs these stakeholders about language teaching and learning in online learning environments. First, the study benefits in-service teachers and school leadership in Hungary, Kazakhstan, and Poland working with students of the 21st century. Knowing 21st century students' approaches to learning remotely, in-service language teachers and school leadership can make informed decisions about their teaching practices incorporating technology into their pedagogy and strategies to teach the subject discipline. Second, the study informs the work of policy makers in Hungary, Kazakhstan, and Poland. The current study provides empirical evidence to support both the curriculum of pre-service language teachers and professional development of in-service language teachers with robust policy measures for promoting student learning and training teachers on their technological pedagogical and content knowledge.

The study also sheds light on the degree of important implications for joint efforts by the policy makers and educational technology industry. Specifically, qualitative evidence of the study fosters our understanding of the pedagogical use of technology maximising teacher effectiveness to enhance SL. Finally, the study stresses upon the necessary commitment needed from parents as to promoting their digital education and collaboration with schools in supporting SL in Hungary, Kazakhstan, and Poland.

Furthermore, some of the policy implications that this study offers are related to the development of policies aimed to improve curriculum changes for pre-service language teachers and ongoing support for in-service language teachers. Targeting an area of technological and pedagogical content knowledge, these policies strive to address relevant changes in equipping language teachers with equitable access to technologies and upgrading their digital literacy skills. Equally, families, especially from low-income and rural backgrounds, can benefit from similar programs.

This study also offers implications for teacher practice at the school- and teacher level. The findings of this mixed method convergent parallel study can inform school leaders about the opportunities for further teacher professional development. Furthermore, the results of this study can encourage language teachers to collaborate and exchange best case practices in online language teaching practices, providing regular feedback to students on their performance, and collaborate with families on supporting students' responsible use of technology at home.

Finally, the study offers future avenues of research in technology-enabled language teaching and learning and teacher education. This study has implications to further explore the area of the digitalisation of teacher education. Moreover, the study can be further extended to examine the extent of digital governance in the context of sustainable education and the future of education.

Chapter 2 Literature Review

Overview

This chapter has several aims. First is to contextualise this study within the field of technology-enabled language teaching and learning and educational technology studies. Specifically, this chapter uses a multi-theoretical approach to extend the field of TE in OLEs. Second, to show the originality of this research by reviewing and synthesising past studies investigating the phenomena under the question. That is, works pertinent to the fields of computer-assisted language learning (CALL), mobile-assisted language learning (MALL), computer mediated communication (CMC), and technology-enabled language learning (TELL) research are reviewed in this chapter. Third, this literature review attempts to be comprehensive given the complexity of the topic. However, this literature focuses on the most essential literature in the above-mentioned research areas to respect the reader's resources and dissertation page limitations. Finally, as this study seeks to re-visit the framework and understanding of TE and the role of families in supporting SL in OLEs, this literature review is interconnected with chapter 3 Methodology. In doing so, I argue that our current understanding and conceptualisation of teacher effectiveness in supporting students in online learning is insufficient. There are external and internal factors involved affecting studied constructs, TE, families, and SL in the context of online learning. Therefore, we need to view them comprehensively and jointly. This chapter aims to fulfil this conceptual gap.

This chapter begins with the terminology widely used in educational technology studies offering an overview of what is understood in the field (Section 2.1). Second, the chapter details the theoretical background surrounding TE and SL in the EFL online (Section 2.2). The section synthesises the empirical background of technology integration research with relevance to teacher knowledge, online language learning in K-12, and family factors affecting SL studies.

Following the body of theoretical frameworks and empirical literature the chapter continues with an overview of educational policy in the digitalisation of public education in Hungary, Kazakhstan, and Poland pre-COVID-19 (Section 2.3). This section is delimited to the European and Kazakhstani contexts because the present research investigates how teaching and learning was organised and carried out in these geographies in times of crisis such as the COVID-19. Therefore, it is pivotal to understand how technological progress was reflected in the educational policies and in the national curricula of Hungary, Kazakhstan, and Poland pre-COVID-19.

Next section explores factors shaping school stakeholders' perceptions on the use of technology in language teaching and learning. Specifically, Section 2.4 reviews the emerging themes in the literature reflecting on internal and external barriers in teacher technology integration practices; Section 2.5 brings insights from the perspective of home dynamics, parental involvement, and socio-cultural contexts. Finally, Section 2.6 provides an important discussion of EdTech integration in public education reflecting on the enactment of digitalisation in public education. Followed by a section on research gaps (Section 2.7), the chapter summarises the key points of theoretical and empirical literature of technology integration in language teaching and learning.

2.1 Definition of terms

Throughout this study I have used a number of key terms related to both language education and educational technology. Although technology is defined broadly, this dissertation considers educational technology or digital tools that can be used in language teaching and learning in synchronous and asynchronous mode of learning.

Learning can take place in various modalities distinguishing between a degree of face-to-face instruction and virtual learning. Today digital tools are primarily used to provide learning virtually; thus, an introduction to online learning (OL), distance learning (DL), remote learning (RL), emergent remote education (ERE), online learning environments (OLEs), and student learning (SL) in the context of OLEs is necessary. It is important to emphasise that as technologies have developed over time, the necessity to revisit existing terminologies is crucial in researching the educational technology field. Moreover, with the changes in the field and the increased technology use for ERE during the global pandemic, clarification on the usage of the types of online learning is necessary. In defining *online learning (OL)* I follow Singh and Thurman (2019)

> "education being delivered in an online environment through the use of the internet for teaching and learning. This includes online learning on the part of the students that is not dependent on their physical or virtual co-location. The teaching content is delivered online, and the instructors develop teaching modules that enhance learning and interactivity in the synchronous or asynchronous environment".
>
> (p. 302)

Distance learning (DL) is a type of instruction characterised by a distance between a learner and an instructor and occurring at different time and locations (Moore et al., 2011). *Remote learning (RL)* means provision of learning for a group of students in class and another group of students follows learning synchronously from a remote location. For the context and

purpose of this study, *emergency remote education* (ERE) means a response to crisis caused by the global pandemic COVID-19 characterised by the absence of quality in the cautious design and development process of teaching and learning online (Bozkurt & Sharma, 2020; Hodges et al., 2020), and face-to-face teaching (Erarslan, 2021).

Furthermore, for the purposes of this dissertation, *online learning environments* (OLEs) are technically supported learning environments excluding face-to-face interactions (Müller & Mildenberger, 2021). OLEs can include emerging platforms such as learning management systems (LMS) (Ouadoud et al., 2017). The most essential characteristics of LMS as an educational tool is their resources aiding teacher-student- content interactions (chats, wikis, forums) (Joksimović et al., 2015). In ensuring student learning for K-12 learners in times of crisis such as the COVID-19 pandemic, this dissertation considers student learning designed to yield learning opportunities for all students in OLEs. To that end, *student learning* in OLEs is situated in a self-regulated learning framework encouraging students to use metacognitive skills in learning for further proactivity, performance and self-reflection in learning (Ergen & Kanadli, 2017). Furthermore, in the context of crisis *student learning* in K-12 in OLEs is also characterised by proactive teacher and family involvement in supporting students, e.g., by ensuring individual learning needs, adjusting a pace of learning, and building teacher-student-content interactions, to name a few.

Defining these terms presented above is essential for two reasons. First is to narrow the focus and aid the discussion of the terminology in the dissertation, often used interchangeably in the text. Second, by addressing the differences inherent in the variety of educational theories on learning, this section examines theoretical and empirical literature on the topics of language learning with digital tools for learning purposes in the school and home premises.

2.2 Theoretical background

In this section I will first introduce key theories and concepts as the lens for this mixed-method convergent parallel study because of their unique focus on observing language TE, as the first concern in this study, and how students learn in OLEs. Although there are no studies, to the author's knowledge, that inquire into (foreign) language teachers' practices in relation to their effectiveness in the manner in which I propose, studies in educational effectiveness, TELL, CALL, MALL, CMC studies in the context of higher education offer pieces of information about aspects of (language) TE to support SL in OLEs. This review, however, will not explore studies related to teacher cognition, value-added models of TE, conceptualisations of professionalism, professional capital in teaching, and human capital research from the economics literature.

In organizing previous research in educational technology studies and technology integration in language teaching and learning into a literature review, I am integrating various theoretical propositions. In doing so, I aim to elucidate what is agreed upon, and what is at issue in understanding TE to support SL in OLEs. Namely, this section elucidates Framework for Teaching (FfT) (Danielson, 2013), technological pedagogical and content knowledge skills (TPACK) (Mishra & Koehler, 2006), and the Community of Inquiry (CoI) (Garrison et al., 2000).

The second central concern of this study is to understand the role of families in being involved with SL in OLEs in the context of the COVID-19 pandemic crisis. In discussing families' roles in supporting SL in home-based learning because of the pandemic this section focuses on the Ecological Systems theory (Bronfrenbrenner, 1979), Bourdieu's theory of (forms of) capital (1986), and the Digital Divide. In doing so, I seek to be able to explain how external circumstances, i.e., the digital divide, and internal factors such as family backgrounds (SES, parents' occupational and educational attainments, parents' beliefs on technology use for education) affect SL.

2.2.1 Teacher Effectiveness

Teacher Effectiveness (TE) has been continuously explored encompassing studies addressing a wide range of topics. Research has investigated teachers' own constructs of effectiveness (Kington et al., 2014; Simpson et al., 2022), generic features of effective teaching (Hattie 2003; Polk 2006), and what teachers do in classrooms (Sammons et al., 2007). Some other studies investigated teaching behaviours (e.g., Campbell et al., 2003) while others produced models of teaching (McBer, 2000) including a view on a differentiated and dynamic model of teacher effectiveness (Creemers, 1994; Creemers & Kyriakides, 2005, 2008, 2010a, 2010b) by expanding the view to the school level (Muijs & Reynolds, 2017).

Decades of research on TE showed that the field lacked clarity on what is meant by teacher effectiveness (Bardach & Klassen, 2020). With a growing focus on standardisation of the teaching profession and regulations, TE research has continued defining the notion and quality in relation to student learning and attainment. Specifically, some studies proposed value-added approaches to measure student academic progress linking teacher subject knowledge and observed teaching practices (Hill, 2009). Other studies focused on professional development and school constituencies (Muijs & Reynolds, 2017) at the same time trying to include a professional development stage to the TE definition. Although these studies appreciated different needs of teachers, necessary to sustain effectiveness over teaching years,

they implicitly assumed that teachers need development to become a subject matter expert (Kington et al., 2014).

Findings from recent studies have placed focus on the economic value of teacher performance measured in the results of student academic achievement (Bardach & Klassen, 2020; Hanushek et al., 2023). Some other publications (e.g., see Coady et al., 2020; Morris-Mathews et al., 2021) considered TE as teacher quality. With implications for education policy, TE research justified effective accountability, pay rewards for good teacher performance, staff termination, and school closures (Bardach & Klassen, 2020; Hanushek et al., 2023). Despite these attempts to provide a diverse view on the TE, there has been insufficient focus providing a theoretical perspective to explain what elements of TE impact SL in traditional classrooms and how they do it.

In the EFL field this question has persisted among educational scholars and teachers (Coady et al., 2020). Various studies attempted to evaluate teachers' specific instructional practices to support English learners' learning in K-12 (Echevarría et al., 2015; Tang et al., 2020) examining the issue from students' perspective (Hongboontri & Chen, 2021). Yet, little is agreed about how teaching practices in the EFL contexts, especially with different teacher attributes and learner settings, can be measured best and used nearly universally to assess teachers.

In relation to the times of crisis such as the recent COVID-19 pandemic where teachers felt unprepared to implement ERE overnight, there is a need for a more specific understanding of TE in OLEs. Given the complexity of external factors in teaching during emergency situations, the construct of TE requires greater attention. First, to better understand what constitutes TE beyond the classroom level. Second, to address the characteristics or the variables related to the construct occurring in OLEs. To that end, in this study I expand the term *teacher effectiveness* proposed by Campbell and colleagues (2003). In addition to identifying TE as 'the power to realise socially valued objectives agreed for teachers' work, especially, but not exclusively, the work concerned with enabling pupils to learn (Campbell et al., 2003) I adopted existing theories from the educational technology research such as TPACK (Mishra & Koehler, 2006) and CoI (Garrison et al., 2000). I chose these theories because they explain online learning from a student and a teacher perspective. Specifically, TPACK explains integration of technology into pedagogy, and CoI clarifies how three presences – teaching, cognitive, and social- shape online learning experiences for students. Furthermore, as more emphasis is put on teachers' ability to integrate technologies into their teaching, it is essential to research TE through educational technology research lens. Therefore, in this study *teacher*

effectiveness refers to the extent to which teachers are able to integrate technologies into teaching aligning the CoI elements and TPACK to the best of their abilities to support SL in OLEs. Based on the level of the digital divide that teachers experience, the extent of TE will contribute to a stronger or weaker SL. Sections below will discuss theories applied in this study in more detail. To begin with, the following Framework for Teaching (FfT) by Danielson (2013) served as a foundational theory of TE in this study.

Danielson's Framework for Teaching

Charlotte Danielson's Framework for Teaching (FfT), grounded in a constructivist view of learning and teaching (Danielson, 2007; 2013; The Danielson Group, 2019), is most known as one of the protocols in the standard-based teacher evaluation system (Morris-Mathews et al., 2020). According to FfT 2nd edition (2013), it consists of four domains of teaching: planning and preparation, the classroom environment, instruction, and professional responsibilities. The four domains of teaching responsibility consider 22 elements. Figure 1 summarises the Framework. I selected Domains I and II, Planning and Preparation and the Classroom Environment because these domains capture the essence of teaching practices one needs to set up to promote learning. Additionally, these domains aided in conducting this study and they did not violate participants' personal data and were feasible to conduct this research. I will provide a detailed account of methodological decisions in Chapter 3.

Domain I, Planning and Preparation is about organisational work required for classroom instruction. It consists of six elements: Demonstrating Knowledge of Content and Pedagogy, Demonstrating Knowledge of Students, Setting Instructional Outcomes, Demonstrating Knowledge of Resources, Designing Coherent Instruction, and Designing Student Assessments. Domain II, the Classroom Environment consists of four elements: Creating an Environment of Respect and Rapport, Establishing a Culture for Learning, Managing Classroom Procedures, Managing Student Behaviour, and Organising Physical Space. Each domain offers four levels of performance that teachers are evaluated on across content areas. These are unsatisfactory, basic, proficient, and distinguished. The ratings of teacher performance are based on classroom observations and a portfolio review typically conducted by well-trained school administration or certified by the Danielson Group observers. The FfT promotes performance-based teacher evaluation and provides rubrics for observers to make informed decisions on teacher professional development after classroom observations. Figure 1 on the next page depicts components of the Domains I and II and their elements.

Figure 1 Framework for Teaching (Danielson, 2007, pp. 3-4)

Domain 1: Planning and Preparation

Component 1a: Demonstrating Knowledge of Content and Pedagogy
- Knowledge of content and the structure of the discipline
- Knowledge of prerequisite relationships
- Knowledge of content-related pedagogy

Component 1b: Demonstrating Knowledge of Students
- Knowledge of child and adolescent development
- Knowledge of the learning process
- Knowledge of students' skills, knowledge, and language proficiency
- Knowledge of students' interests and cultural heritage
- Knowledge of students' special needs

Component 1c: Setting Instructional Outcomes
- Value, sequence, and alignment
- Clarity
- Balance
- Suitability for diverse learners

Component 1d: Demonstrating Knowledge of Resources
- Resources for classroom use
- Resources to extend content knowledge and pedagogy
- Resources for students

Component 1e: Designing Coherent Instruction
- Learning activities
- Instructional materials and resources
- Instructional groups
- Lesson and unit structure

Component 1f: Designing Student Assessments
- Congruence with instructional outcomes
- Criteria and standards
- Design of formative assessments
- Use for planning

Domain 2: The Classroom Environment

Component 2a: Creating an Environment of Respect and Rapport
- Teacher interaction with students
- Student interactions with other students

Component 2b: Establishing a Culture for Learning
- Importance of the content
- Expectations for learning and achievement
- Student pride in work

Component 2c: Managing Classroom Procedures
- Management of instructional groups
- Management of transitions
- Management of materials and supplies
- Performance of noninstructional duties
- Supervision of volunteers and paraprofessionals

Component 2d: Managing Student Behavior
- Expectations
- Monitoring of student behavior
- Response to student misbehavior

Component 2e: Organizing Physical Space
- Safety and accessibility
- Arrangement of furniture and use of physical resources

(figure continues)

Domains, Components, and Elements of the Framework for Teaching *(continued)*

Domain 3: Instruction

Component 3a: Communicating with Students
- Expectations for learning
- Directions and procedures
- Explanations of content
- Use of oral and written language

Component 3b: Using Questioning and Discussion Techniques
- Quality of questions
- Discussion techniques
- Student participation

Component 3c: Engaging Students in Learning
- Activities and assignments
- Grouping of students
- Instructional materials and resources
- Structure and pacing

Component 3d: Using Assessment in Instruction
- Assessment criteria
- Monitoring of student learning
- Feedback to students
- Student self-assessment and monitoring of progress

Component 3e: Demonstrating Flexibility and Responsiveness
- Lesson adjustment
- Response to students
- Persistence

Domain 4: Professional Responsibilities

Component 4a: Reflecting on Teaching
- Accuracy
- Use in future teaching

Component 4b: Maintaining Accurate Records
- Student completion of assignments
- Student progress in learning
- Noninstructional records

Component 4c: Communicating with Families
- Information about the instructional program
- Information about individual students
- Engagement of families in the instructional program

Component 4d: Participating in a Professional Community
- Relationships with colleagues
- Involvement in a culture of professional inquiry
- Service to the school
- Participation in school and district projects

Component 4e: Growing and Developing Professionally
- Enhancement of content knowledge and pedagogical skill
- Receptivity to feedback from colleagues
- Service to the profession

Component 4f: Showing Professionalism
- Integrity and ethical conduct
- Service to students
- Advocacy
- Decision making
- Compliance with school and district regulations

Danielson Framework for Teaching has a number of strengths. It has proven to be one of the most widely used observational systems for the purposes of TE evaluation (Hunzicker, 2017) and igniting professional development conversations in schools. The purpose of the Framework is to improve SL by strengthening teacher instructional practice (Sejnost, 2014 as cited in Hunzicker, 2017). FfT provides flexible approaches in evaluating TE by an ability to be used in different disciplines and is interpreted at the domain level (Danielson, 2013). Another strong aspect of the Framework is that it accounts for teacher knowledge on students' background, communication with families, and issues of organising physical space with regards to students' safety and accessibility (ibid). However, there are limits to how far the instrument can be used. First, FfT treated observable TE in traditional schools. Although it includes an element of considering information and communication (ICT) tools in teaching and learning (Danielson, 2013), it does not provide the depth and breadth of the role of technology in the classroom in teaching and learning. The present conceptualisation of the FfT is limited in defining technology-learner level of interaction and the learner-learner interaction in asynchronous or synchronous teaching and learning. It also lacks strategies for student engagement, for teachers interacting with students in synchronous teaching, and does not provide guidance for the observer of teacher's online teaching practices, especially in post-COVID-19 era (The Danielson Group, 2019). Second, the available quantitative studies have typically been conducted on the basis of multiple observations of various tools such as FfT and Classroom Assessment Scoring System (CLASS) (Sandilos et al., 2019) estimating various components such as lesson segments, raters, classrooms, and their interactions (Briggs & Alzen, 2019); or FfT and Behaviorally Anchored Rating Scales (BARS) (Martin-Raugh et al., 2016) measuring teacher practice providing delineating levels of performance via a set of behaviors. For the context of emergency situations such as the COVID-19 pandemic, inferring about TE requires a multifaceted array of evidence that the current FfT (Danielson, 2013) does not provide. Third, the perceived lack of importance of FfT is seen in the paucity of qualitative research and publications analysing qualitative data of the observational tool of FfT. The lack of qualitative research devoted to understanding how teachers' practices in domains I and II, Planning and Preparation and the Classroom Environment, might limit our understanding of how teachers' practices in these domains could be further improved. Available studies (Briggs & Alzen, 2019; Coady et al., 2020; Morris-Mathews et al., 2020) typically indicate the importance of the observational tool in vague terms. These studies briefly summarize approaches for conducting a future piece of quantitative research devoted to expanding the sample of research participants in traditionally studied disciplines of mathematics and language arts. However, the researchers

(Briggs & Alzen, 2019; Coady et al., 2020; Morris-Mathews et al., 2020) disregarded the complex nature of TE and the need to study it from a qualitative perspective as well. Fourth, the FfT scoring approach is highly subjective based on the evaluator's proficiency in using the classroom tool. Finally, some available studies (Morris-Mathews et al., 2020) concluded FfT might be directing teachers to some teaching practices that could serve as barriers to equitable and efficient learning.

At this juncture, a new comprehensive TE model is necessary which can demonstrate the potential to offer an analytical account of evaluating TE by identifying how in-service teachers promote SL in OLE and how in-service teachers can be prepared to manage student-related, pedagogical, and operational challenges associated with online teaching (Farmer & West, 2019). Therefore, in this dissertation I suggest means of overcoming prior methodological limitations found in reviewed empirical studies that employed FfT as one of their quantitative data instruments.

2.2.2 Community of Inquiry

Community of Inquiry (CoI) is based on the philosophy of John Dewey and social constructivism of Vygotsky (Castellanos-Reyes, 2020). Developed by Garrison et al. (2000), CoI offers a comprehensive framework consistent with social constructivism to learning wherein teachers and learners are involved in synchronous and asynchronous interactions of social, technological, and pedagogical processes. The pedagogical value of CoI has been documented in various studies (Garrison et al., 2000; Gurley, 2018; Kazanidis et al., 2018; Lim, 2018; Sadaf et al., 2021) because of its orientation toward knowledge (co)creation collaboratively through online social interactions. It has been studied by many researchers providing insights for studying in OLE (Caskurlu et al., 2021; Cleveland-Innes, 2019; Park & Shea, 2020) and widely used in higher education studies since its development (Kaczkó & Ostendorf, 2023; Shea et al., 2010) in flipped classroom research (Taghizade et al., 2023) and integrated online-team-based learning (Parrish et al., 2021). CoI uses a CoI survey (Arbaugh et al., 2008) and a coding scheme (Garrison et al., 2000) capturing the three presences to determine learning progression (Garrison, 2017). Researchers frequently use these instruments (Sadaf et al., 2021; Stenbom, 2018) to measure various aspects of online learning within the CoI framework.

Garrison et al's. (2000) seminal article distinguishes the CoI framework, illustrated in Figure 2[1] below, as the three key dimensions (presences) of learning referred to as:

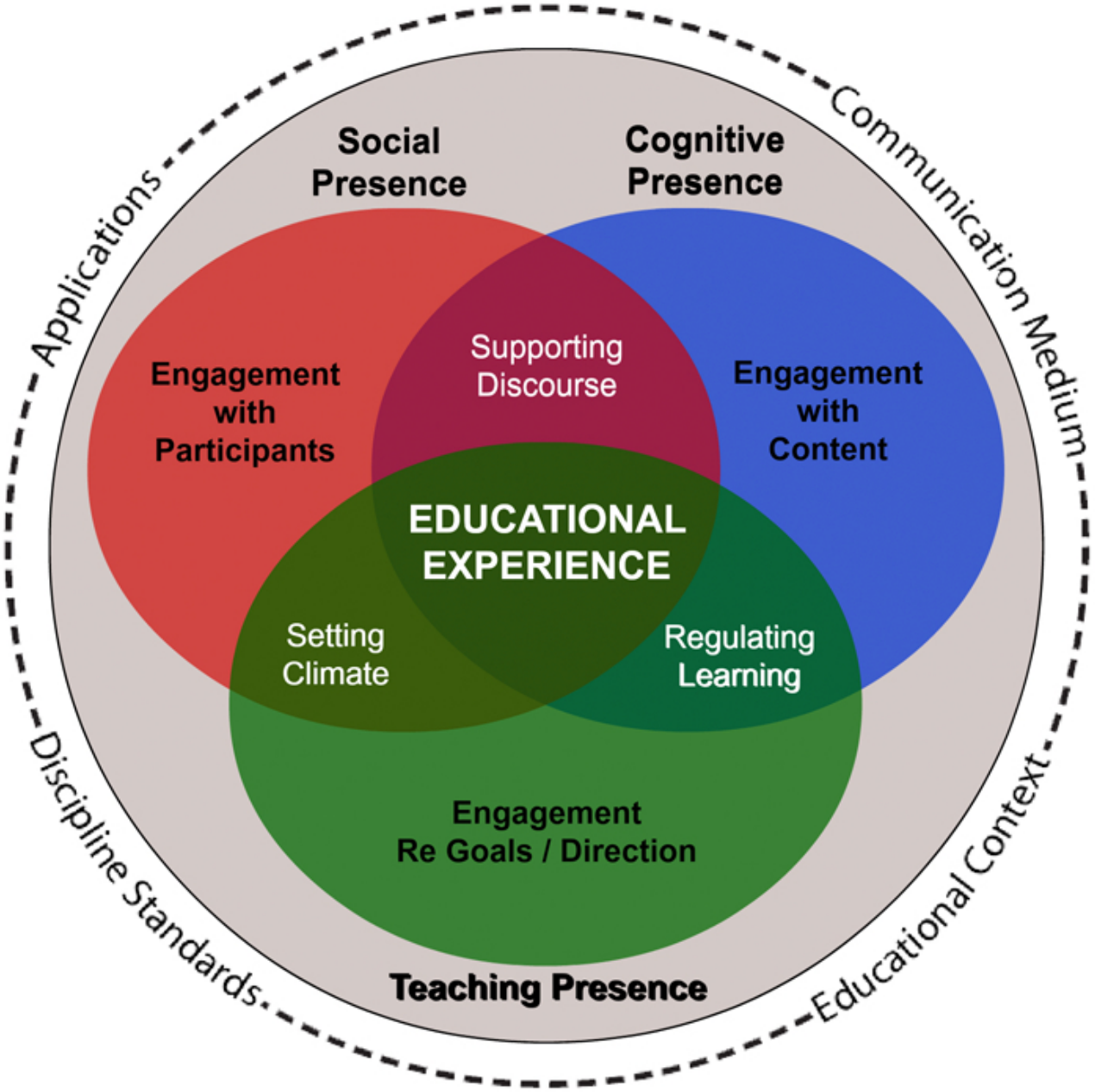
- *Teaching presence (TP)* informs about an instructors' role before and during the course, including 1) course organisation and design; 2) direct instruction, and 3) facilitation (Garrison et al., 2010; Anderson et al., 2001). This presence promotes cognitive and social processes to realize personally meaningful and educationally valuable learning outcomes (Wang & Liu 2020). Garrison (2000) explained how technology tools and teaching strategies help create TP to transform OLEs to communities of inquiry.
- *Cognitive presence (CP)* is concerned with students' development of critical and higher-order thinking. It is operationalised through the four phases of inquiry learning: 1) triggering event (problem conceptualisation); 2) exploration (idea generation); 3) integration (knowledge synthesis), 4) resolution (knowledge application and vicarious testing) (Choy & Quek, 2016; Garrison et al., 2001).
- *Social presence (SP)* refers to the development of social interactions among the learning group within a productive social climate. It includes 1) open communication; 2) effective expression, and 3) group cohesion (Serembus & Murphy, 2020).

Since Garrison et al. (2000) first published the CoI framework, many studies have been conducted, refined, and confirmed the use of CoI framework mainly in higher education studies (e.g., Hilliard & Stewart, 2019; Garrison et al., 2010). Important to note, that in planning the learning environment, the instructor should plan and create all three types of presences, i.e., teaching presence, cognitive presence, and social presence (Garrison et al., 2010). Despite the fact that there are several models or frameworks offering insights into how online learning meets students' needs, this study is framed in the Community of Inquiry. This framework explains how its three presences contribute to SL including deep learning (Garrison et al., 2000), student academic performance (Sadaf et al., 2021), pedagogical approaches, and human interactions in OLE. Below I will examine previous research on each of the presences and exploring the relationship of the interplay between teaching presence, cognitive presence, and social presence with their effect on SL.

[1] Image used with permission from the Community of Inquiry website and licensed under the CC-BY-SA International 4.0 license (https://creativecommons.org/licenses/by-sa/4.0/). The original image is located at https://www.thecommunityofinquiry.org/framework

Figure 2 Community of Inquiry

Original source: Garrison et al. (2000)



Overview of Empirical Studies on Teaching Presence and Student Learning

Defined as "the binding" component of a CoI (Davies & Meissel, 2018; Garrison et al., 2000) TP has been recognised as a predictor of SL in previous studies (Caskurlu et al., 2020; Dempsey & Zhang, 2019; Akyol & Garrison, 2008) with SP and CP depending on it (ibid). Elements of TP (instructional design and organization, discourse facilitation, and direct instruction) (Garrison et al., 2000) have been used as measures of the visibility of a teacher in OLEs through students' views. The design and organisation component refer to the communication of course content, learning goals, assessment and learning activities, and teacher's communication of the organisational aspects of the course (e.g., due dates and timetables). Facilitation deals with students' reflections, discussions, and the developmental work toward establishing and bolstering a sense of community. Lastly, direct instruction explains how the teacher reacts to students' discussions and provides feedback. It is important to note that the "teacher" can be "a more skilled peer who scaffolds a novice's learning in addition to the course instructor" (Anderson et al., 2001, p.8).

To date, research has shown that TP significantly predicts students' perceived learning and satisfaction. Past studies showed positive strong relationship between TP and students' perceived learning and satisfaction (Arbaugh et al., 2008; Akyol & Garrison, 2008; Caskurlu et al., 2020; Khalid & Quick, 2016; Lim, 2018). Importantly, Kyei-Blankson et al. (2019) found that 88% of students rated TP as one of the most significantly essential elements to their learning. Furthermore, Rubin and Fernandes (2013) emphasised the extent of the teacher presence in the course fosters collaboration of students' work and directs it. One of the conclusions stated in these studies is that TP and its components (instructional design and organization, discourse facilitation, and direct instruction) play a significant role in promoting students' perceived learning and satisfaction in OLEs.

Studies examining TP to measure instructional efforts used a variety of data sources including discussion forums, full-group discussions, course announcements, public questions, small-group student discussion spaces, and private student-instructor communication. Results indicated that student-centred pedagogies in concert with regular communication outside online courses facilitate TP in OLEs. According to Wang and Liu (2020), students' ratings on TP showed consistency in course design and organisation or facilitation dimensions. Specifically, their study found that transparent communication of the course goals, clear

communication on assignments and deadlines, and clear teacher expectations were important to students rather than direct instruction. Furthermore, there is a growing research evidence illustrating how instructor's and/or teacher's actions encourage better learning. For example, Thiessen (2015) reported about students' views on how their learning improved when their instructors provided their own perspectives and insights. Similarly, Wang and Liu's (2020) study explained how communication on course design and facilitation were more important to students than direct instruction. Wang and Stein (2021) showed the connection between design and facilitation and the enhancement of student learning. Likewise, according to Caskurlu and colleagues' (2021) systematic literature review, there are at least three factors that learners appreciated the most in teacher's actions in OLEs. Namely, 1) active and interactive instructors in the course, 2) timely and detailed feedback from instructors, and 3) instructor's presence in the course. These findings are not surprising given that the elements of TP contribute to students' sense of connectedness to course participants and to their learning.

On the other hand, other researchers suggest that there are several challenges in TP to SL in online settings. One challenge lies in teachers' abilities and skills to transition to online teaching. This challenge includes acquiring new skills by teachers and adapting their pedagogical approaches for the requirements of OLEs (Zulu, 2022). An earlier study by Erickson and Wattiaux (2021) contrasted teachers' and students' reports on the establishment of TP in online learning. While teachers drew attention to the diversity of teaching methods used in online learning, students witnessed a difference in teaching methods based on courses they took. This result indicates the importance and need to establish an effective TP to promote SL in OLEs.

Creating and fostering a sense of community in OLEs is another challenge. According to a few studies (Bolliger et al., 2019; Turk et al., 2021) there are at least four kinds of difficulties that participants emphasised as important in regard to learning in online communities. These are poor teacher-learner interactions, unreliable assessment methods, online course sizes, and instructors' lack of skills in fostering sense of community among online students (ibid). One possible explanation of teachers' poor ability to build interactions with their online learners is that some teachers may still apply traditional teaching to OLE. As a result, the lack of teachers' effective delivery of instruction in OLE might cause students' quality of participation, satisfaction, and learning (Bao, 2020). Another possible explanation of how instructors' poor ability to design lessons does not contribute to creating a sense of community online lies in TP behaviours. Teachers, or instructors, who limited facilitating student discourse in OLE, found their lessons might not have met online students' needs.

Next challenge in maintaining TP impacting SL is assessment methods used by instructors in OLEs. Some recent studies showed that instructors used traditional for OLEs assessment methods such as rubric-based and self-regulated assessments (Turk et al., 2021). Some other instructors used un-grading pedagogy to illustrate student progress "without numbers" (p.168). Yet, this variation in assessment methods is highly context-dependent and depends on instructor's pedagogical stance and experience. The instructors will need to consider the flexibility of the un-grading approach in designing their TP in OLEs.

To address these challenges, it is important that instructors and institutions seek for providing adequate training and infrastructure in online teaching methods. For instance, Bao's (2020) seminal work concluded five high-impact principles for online education. These principles include a) high relevance between online instructional design and SL; b) effective delivery of taught material online; c) adequate support provided by instructors to learners; d) high quality of student participation, and e) contingency plan to continue teaching and learning despite of sudden issues in online educational platforms. Furthermore, online teachers and institutions may consider taking a professional training to enhance the quality of OLE from the teaching perspective (Turk et al., 2021).

Overview of Empirical Studies on Cognitive Presence and Student Learning

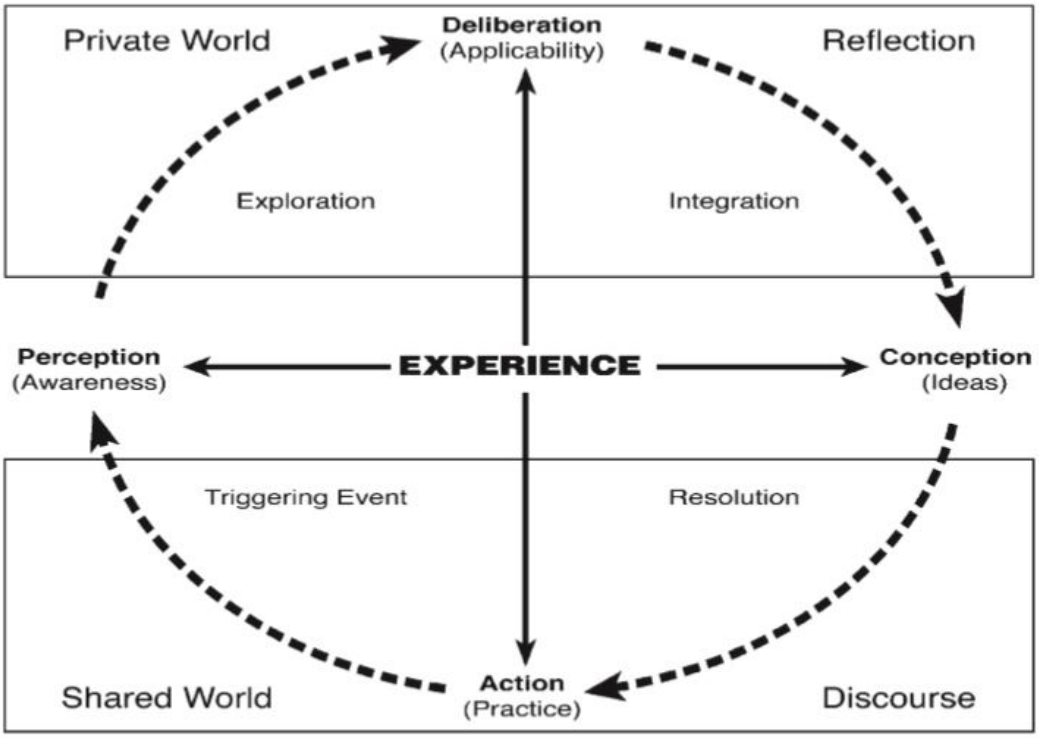
Defined as "the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse" (Garrison et al., 2001, p.11), cognitive presence guides the design and implementation of OLEs. Based on Dewey's (1933) reflective thinking, CP uses the Practical Inquiry Model[2] (PIM) (Garrison, 2007) and is viewed by some scholars (Garrison & Vaughan, 2008) as the heart of the CoI. According to PIM, illustrated in Figure 3, triggering event initiates problem conceptualisation in the public sphere. Then reflective stage ensues in exploration, searching for information, and sharing explanations. Integration phase offers meaning-making of new ways in engaging and knowledge-construction followed by the highest phase in the Model, resolution. When learners achieve resolution of the original cognitive challenge, they apply new knowledge and defend possible solutions by offering new ideas (Choy & Quek, 2016; Garrison et al., 2001). In practice, learners rarely proceed to the level of integration and less so to resolution. This conclusion was prominent in studies by

[2] Appendix A includes D. Randy Garrison's permission to use Practical Inquiry Model image in this dissertation and future publications. Adapted from the Community of Inquiry Model. Original image is located at https://coi.athabascau.ca/. Retrieved 30th July 2023 from https://coi.athabascau.ca/

Galikyan and Admiraal (2019), Gašević and colleagues (2015), Jansson et al. (2021), Kaul and the team (2018), Kilis and Yildirim (2019), and Vaughan and Garrison (2005). On the contrary, other studies (Sadaf & Olesova, 2022; Zhu et al., 2019) found that exploration was the most common in student action followed by integration within the CP. This difference between the manifestation of CP elements could be explained by students' acts of informing evidence. For example, in the case study of Zhu et al., (2019) students opinionated more in discussion posts and provided more personal ideas and solutions in comparison to less exploration and integration of their ideas.

Figure 3 Practical Inquiry Model

Original source: Garrison (2007)



To increase the quality of online education from CP perspective it is imperative to understand students' CP characteristics and practices supporting the development of CP. One of the ways to promote CP and support SL online is via facilitation. Past research provided some evidence toward facilitative role of instructors in bolstering SL online (e.g., Guo et al., 2014). Nevertheless, some research (Hew, 2015) on peer facilitation is concerned to assign a course instructor as a solo provider of advancing CP in OLEs for students. The concern views the instructor's 'authoritarian presence' oppressing students' voices. However, recent research

(Chen et al., 2019a) investigated the facilitation techniques used by peer facilitators, i.e., untrained students in facilitation techniques. The team (Chen et al., 2019a) looked for various facilitation techniques, e.g., questioning, clarifying information, summarising or re-voicing online discussions using positive social cues. The most essential conclusion that these scholars drew from their study is that these students-facilitators did not exhibit peer facilitation behaviours intensively enough. Hence, the research team were not able to identify statistical association between the facilitation techniques and students' CP (p.53). Similar results were found in Gašević et al. (2015) and Hew (2015) pointing at a lack of training in students' peer facilitation techniques and improving their intellectual engagement to promote SL within the CP.

In connection to peer facilitation techniques mentioned above another study was conducted involving peer interactions supported by course instructors (TP). Almasi and Zhu (2020) conducted a mixed-method study investigating Tanzanian students' perception of CP and its relationship with academic performance. Their quantitative results reported students' possessed high CP. In contrast, their qualitative findings showed that students' CP was low linked with lack of promptness of feedback, time constraints, and lack of confidence.

The above-presented results elaborate the absence or the lack of the most advanced levels of CP in students' online discussions from at least three perspectives. First, CP deals with students' development of critical and higher-order thinking that can be achieved with thoroughly planned duration of online learning experiences. The lack of empirical evidence in students' meaning-making and deep engagement in learning at integration and resolution phases in CP could be related to organisational aspects of planning online learning. That said, aspects such as duration of online discussions, discussion strategies, and timely feedback have been found critical in generating higher levels of CP (Epp et al., 2017; Rolim et al., 2019; Sadaf et al., 2021). Second, it could be suggested that studies focused on the adaptation of traditional teaching and learning to OLEs. Until 2007 the research related to CoI has focused on analysing presences individually (Garrison & Arbaugh, 2007) and instructional strategies has been one of the most cited research topic of cognitive studies in e-learning. This conclusion is well aligned with some studies in OLEs dated as long as 2007 (Shea, 2007) and 2021 (Sadaf et al., 2021). Third explanation relates to the association of CP with the learning objectives of the strategies. Some scholars (Garrison, 2017; Sadaf & Olesova, 2017) arrived at concluding that course instructors need to combine instructional strategies (TP) with effective instructional design. By doing so, the learners have an opportunity to engage in a purposeful collaboration

learning as they progress through the PIM. This explanation is worth studying as it illustrates a close interconnection between TP and CP.

To address the issues related to the increase of students' CP in online learning, some authors (Sadaf & Olesova, 2022; Zhu et al., 2019) recommend designing online learning in a way that CP interacts with other presences to enable triggering actions and resolution in SL in OLEs. By enabling students in supporting their own process of inquiry through trainings on developing TP elements students and instructors have a potential to support SL in OLEs. Another approach would be to uncover the relationship between the elements of SP, TP, and CP by tapping into a specific connection between various elements of each of the presences (Rolim et al., 2019).

Overview of Empirical Studies on Social Presence and Student Learning

Social presence refers to the "ability of participants to identify with the community (e.g., course of study), communicate purposefully in a trusting environment, and develop inter-personal relationships by projecting their individual personalities" (Garrison, 2009, p. 352). The first component of SP, affective expression, corresponds to students' sense of knowing each other, social interactions, and sense of belonging to the course. Next component, open communication, is about students' purposeful and trustful interactions with other students and course discussions in the online environment. Finally, group cohesion refers to students' sense of collaboration within a learning community where they can acknowledge different perspectives. In other words, measuring SP is crucial to assess the quality of online learning experience for students (Flener-Lovitt et al., 2020).

According to Garrison et al. (2000), "[w]hen social presence is combined with appropriate teaching presence, the result can be a high level of cognitive presence leading to fruitful critical inquiry" (p. 96). That is, it can be acknowledged that high levels of SP contribute to learners' positive impact in CP and TP. For instance, in a series of online lab-specific activities 35 undergraduate students learnt about aviation and improved their aviation knowledge cognitively and socially (Ng et al., 2022). Students believed that social interactions encouraged them to learn about aviation knowledge and promote student collaboration. Based on participants' interviews (Ng et al., 2022), interactive features of Web 2.0 tools such as breakout rooms and annotation tools helped the participants to sustain their aviation learning online (p.12).

Furthermore, in Lim's (2023) study SP was recognised as a critical factor in improving 84 students' online learning and outcomes in a discussion network. Specifically, the study

(Lim, 2023) discovered mediating effect of SP on the relationship between students' active participation and perceived learning achievement. The results of this study imply that high levels of SP and learning outcomes can be achieved in discussion network studies.

In contrast, Akyol and Garrison's (2008) seminal work did not find SP affecting learning. The results of their study associated SP with satisfaction. Since that time, researchers provided evidence to varying degrees of the relationship between learning satisfaction and SP (Holbeck & Hartman, 2018; Natarajan & Joseph, 2022) predicting students' dropout rate and final grades. Notwithstanding the foregoing, recent research acknowledged insightful results in relation to the relationship between the SP, learning satisfaction, and teacher effectiveness. The analysis of Shi and colleagues' (2023) study of students' perception of SP in different study groups revealed a potential connection to teacher effectiveness. The authors (Shi et al., 2023) found that the overall students' satisfaction in rating their instructor was closely linked to their course evaluation. This result suggests that the class quality is connected to teacher effectiveness as seen by students.

In relation to the nature of Shi et al.'s (2023) study, past and recent studies with varying composition of study groups have demonstrated contradictory results in improving SP in OLEs. For example, in Akcaoglu and Lee (2016) small discussion groups (group size of 4–5 students) benefited students to engage in higher-order thinking and deeper conversations. Afify (2019) challenged these results claiming that small (group size = 5) and medium-sized (group size =12) groups did not show any difference in their impact on critical thinking skills. Lowenthal and Dunlap's (2020) findings, however, did not suggest that the development of the SP depends on the group size. Their study supported Kreijns et al.'s (2003) argument about group size. Namely, as the group size increases some students will feel lost and contribute less to online interactions. Thus, it can be assumed that small group sizes benefit students in establishing their SP, especially at the beginning of a course. In contrast, an earlier study (Nagel & Kotzé, 2010) concluded that as the group size grows, for example to 100+ students, SP is likely to be high. Despite these contradictory results, more research is needed to find out how SP develops in group sizes of varying degrees in OLEs.

Less is known about observable individual elements of SP in online discussions looking at student interactions, communication, and collaboration. Lowenthal and Dunlap (2020) addressed this gap by conducting a mixed-method exploratory case study and suggested the following. Situational variables such as group size, course duration, instructional task, and previous relationship might influence how SP is established and maintained in OLEs. For example, affective communication can help build an emotional connection with other learners

online. At the same time, using affective communication or the use of emotion may be heavily influenced because of peers' behaviours, especially in small groups. Further research is needed to identify how individual elements of SP (affective expression, open communication, and group cohesion) contribute to the establishment of SP in relation to SL.

Another significant aspect about the nature and development of SP is how it addresses the distance between the instructor and the learner in OLEs. On one hand, a wide variety of online collaboration tools, social learning strategies, and various formats of online learning (e.g., blended/ hybrid/ flipped learning) help build social relations in online learning. On the other hand, students' feelings of isolation, loneliness, lack of peer and instructor interactions may result in student dropouts. However, recent research (Nasir, 2020) showed that issues of isolation, boredom, and withdrawal from courses can be mitigated with high learner satisfaction among adult learners. This area of research needs to be further investigated among K-12 students.

Concluding, social presence remains central in online learning while students find themselves isolated in OLEs. Despite its importance, there are more questions about the SP than available knowledge about it in OLEs. Additional research is needed to better understand how variables such as the elements of SP, group size, teacher effectiveness, and types of interaction between instructors and learners influence students' perceptions of SP in OLEs. Furthermore, more research is needed to understand how K-12 students perceive online learning communities and SP in particular (Garrison, 2017; Villanueva et al., 2022).

Exploring the Interplay of Teaching Presence, Social Presence, and Cognitive Presence in Online Learning

CoI can explain some of the challenges and learner experiences of OLE. It is assumed that three presences play an equal role in shaping deeper learners' experiences (Martin et al., 2022; Szeto, 2015). In other words, the CoI framework illustrates how the instructors facilitate learning (in teaching presence), how learners can sense being a part of a group and enable their learning (in social presence), and how learners are able to construct meaning for learning (in cognitive presence). To illustrate, the nature and design of TP - design, facilitation, and direction- support SP and CP. Design deals with communication (SP) and a plan to create a critical discourse (CP). Facilitation refers to establishing community (SP) and inquiry dynamics (CP). Finally, direction sustains respect and responsibility (SP) and inquiry through resolution (CP). The interplay and interconnection of the three presences need to be thoroughly thought of and well-planned in OLEs (Dempsey & Zhang, 2019).

Despite this importance of the interplay of the three presences, some studies in higher education indicated a varying degree of the three presences in facilitating SL in OLEs in different stages. For instance, Almasi and Zhu (2020) concluded in their study that TP influenced learners' CP in the integration stage. This result is in line with Gašević et al. (2015) and Almasi et al. (2017). Other studies in the past paid more attention to SP (Li & Yu, 2020; Galikyan & Admiraal, 2019) and interconnection of SP and CP. Regardless of these findings, all three presences need to be included in shaping learners' experiences in OLEs (Garrison, 2000).

The three presences share some similarities in how they affect SL. First, there is evidence from a review of 24 studies on the CoI instrument (2008-2017) affirming that CP was more influential on SL than TP and SP (Redstone et al., 2018). Likewise, they found that TP and SP had a significant perceived influence on CP (ibid). This finding supported Hosler and Arend's (2012) study which concluded that CP required strong TP for learners to knowledge construction employing discourse and reflection strategies. These findings reinforced a recent study of Castellanos-Reyes (2020) that claimed how high-level thinking and critical inquiry seen in CP could be advanced through careful design and planning of online tasks and facilitation in TP. A recent study by Pratt and Lai (2023) support and expand the relationship of presences in the CoI. To wit, TP has been shown to predict CP through the mediation of SP (Joksimović et al., 2015; Whiteside et al., 2017); CP is most indicative of student success (Bamoallem & Altarteer, 2022; Yang et al., 2016), student perceived learning, academic performance, and satisfaction (Sadaf et al., 2021), students seem to value TP greatly in supporting their learning process (Caskurlu et al., 2021) through facilitation and discourse direction. In other words, evidence illustrates that instructor involvement (i.e., TP) in the course is important as it yields greater student learning measured in higher-order thinking and critical thinking skills (i.e., CP), supports sense of community through a welcoming learning climate (i.e., SP), content-related interactions, and collaborative work in small groups (Bokhari, 2016; Finley, 2016).

Another similarity can be found between TP and SP. As discussed earlier in this section, contextual variables such as course duration, group size, online discussion formats, online collaboration tools, interactions between peers and instructors have been reported by students as challenging in online learning. These variables have contributed to either poor planning of one of the elements in TP or SP. Additionally, situational factors such as weak Internet connection, lack of teachers' (or instructors') professional training in online teaching, students' behaviour online can be observed as similar challenges between TP and SP in the CoI.

As the present dissertation aims to investigate how language teachers support SL in OLEs, Community of Inquiry theoretical framework fits the aims of this study because it aids the investigation of this study from multiple perspectives. Namely, how learning can be established and further promoted from teaching - , cognitive -, and social presence point of view. Moving on, the next section unpacks the phenomena under question from a teacher knowledge perspective.

2.2.3 TPACK

This section introduces TPACK (Mishra & Koehler, 2006) - Technological Pedagogical and Content Knowledge. First, it establishes one of the frameworks used in this mixed-methods convergent parallel study. Then, the section explores the relationship between each type of knowledge. Finally, it describes the synthesis and evaluation of reviewed empirical TPACK studies in K-12 in different disciplines.

Overview of TPACK

TPACK is a well-known framework among researchers studying technology integration into pedagogy with pre- (Valtonen et al., 2017; Wang et al., 2018) and in-service teachers (Rodríguez Moreno et al., 2019) in all levels of public education (i.e., from pre to high school). It is built on Shulman's (1987) construct of teacher's knowledge in pedagogical content knowledge (PCK) domain to include technology knowledge (TK) into content and pedagogical knowledge. The framework consists of seven types of knowledge, according to Mishra and Koehler (2006), integrating technology to some extent in instruction. These are technological knowledge (TK), pedagogical knowledge (PK), content knowledge (CK), pedagogical content knowledge (PCK), technological pedagogical knowledge (TPK), technological content knowledge (TCK), and TPACK (see Figure 4[3]).

The features of each type of knowledge and TPACK itself are defined as follows (Schmidt et al., 2009):

Pedagogical Knowledge (PK): "It refers to methods and processes of teaching. Classroom management, lesson planning, assessment and student learning are examples of PK as well as overall educational purposes, values, and aims" (Mishra & Koehler, 2006, p.64).

Content Knowledge (CK): This knowledge represents 'actual subject matter to be learned or taught' (Mishra & Koehler, 2006, p.1026). According to Shulman (1986), this

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knowledge would include knowledge of concepts, theories, ideas, organisational frameworks, evidence and proof, and how to develop this knowledge (Mishra & Koehler, 2006, p.63).

Technological Knowledge (TK): It refers to the knowledge about various types of technologies, e.g. from low-technologies as pencil and paper to advanced as the Internet, software programs, and an interactive board.

Pedagogical Content Knowledge (PCK): This knowledge refers to the content knowledge that deals with teaching process (Shulman, 1986). It varies from subject to subject as it blends content and pedagogy aiming at developing better teaching practices in the content area. PCK covers the core of teaching, learning, curriculum, assessment and reporting, and conditions that promote learning connecting curriculum, assessment, and pedagogy (Mishra & Koehler, 2006, p.64).

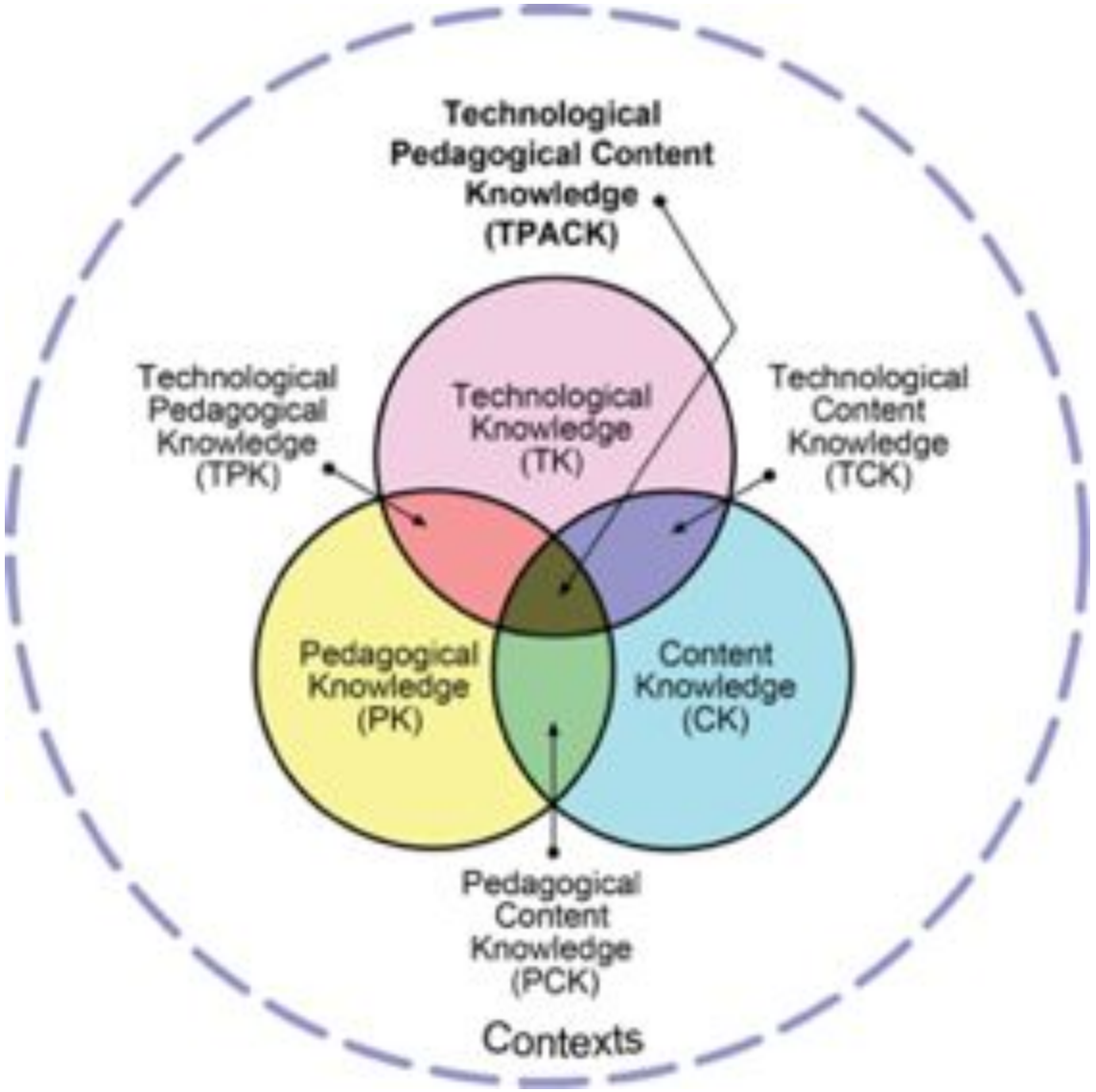
Technological Pedagogical Knowledge (TPK): An understanding of how technology may change the way teachers teach builds knowledge how different technologies can be used in teaching.

Technological Content Knowledge (TCK): Knowledge about how technology can create new representations for specific content that may change the way learners practice and understand concepts in a specific content area.

TPACK: According to Mishra and Koehler (2006, p.66), TPACK is the basis of effective teaching with technology; pedagogical methods of integrating technology and using it in constructive ways in any subject matter content; it is knowledge of how technology can address some of the problems that students face and it becomes easier to learn; it is the knowledge of how technologies can be used to build on existing epistemological beliefs in order to develop new ones or strengthen the old one.

Figure 4 TPACK model

Original source: Mishra & Koehler (2009)



TPACK Assessment in language teaching with in-service teachers

In the field of foreign language teaching and learning TPACK has been mainly used to address the following: a) how TPACK relates to language teachers' pedagogical beliefs, b) how TPACK can be used within a constructivist approach to teaching to enable SL, c) how TPACK explains teachers' attitudes toward technology adoption and barriers towards technology integration. A well-known example of profiling language teachers' TPACK and their pedagogical beliefs is a study by Chai et al. (2013). This study was the first, according to the authors' claim, from the TPACK framework on Chinese language teachers. The key finding revealed that the Singaporean Chinese teachers rated themselves least competent in TPACK but most competent in CK. Another insightful result of Chai et al. (2013) study was that the Singaporean Chinese language teachers needed more professional development to incorporate their constructivist beliefs into their classroom technology practices. This study supported an earlier work of Ertmer (1999) and her later works around teacher pedagogical beliefs and barriers toward technology integration in the classroom.

Teacher pedagogical beliefs, empirical research illustrates, can act as a significant predictor of technology integration for some teachers. For instance, the study involving Greek primary school teachers (Roussinos & Jimoyiannis, 2019) suggested that recent educational reforms and appreciation of teachers' professional work by school stakeholders were associated positively with teachers' perceptions of ICT integration. In contrast to this and another Western-based study (Vongkulluksn et al., 2018), Chinese and South Korean teachers' constructivist beliefs did not show any significant relationship with technology integration classroom practices (Han et al., 2018; Lai et al., 2022). Unlike their US colleagues, Korean teachers showed a gap between their beliefs and what they actually do in the classroom (Han et al., 2018). This interpretation is further supported by Deng et al. (2017) and Roussinos and Jimoyiannis (2019) who observed a difference between the supposed and enacted TPACK among teachers in their studies. This difference of professed and enacted TPACK beliefs and classroom practices might relate to teachers' pedagogical student-centred or constructivist beliefs, and educational and cultural context. Later in Section 2.4 I will discuss the role of teacher beliefs in technology integration based on recent studies across subject disciplines in K-12 and in the EFL context.

In terms of integrating TPACK within a constructivist approach the framework provides teachers with the knowledge and skills to select appropriate digital tools for student-centred learning. The framework builds an alignment between the technology, pedagogy, and content to promote SL. In their well-known work, Koh and the team (2014) analysed 354 in-service Singaporean teachers' constructivist-oriented technological pedagogical content knowledge (C-TPACK) perceptions in a 32-item seven-point Likert-type scale survey. C-TPACK items for the constructive dimension includes scales such as "I can structure activities to help students to construct different representations of content knowledge using appropriate ICT tools (e.g., Webspiration, Mindmeister, Wordle)". Constructivist Pedagogical Content Knowledge (C-PCK) items focused on teachers' facilitation of students' thinking. For example, in addressing students' difficulties with CK the item was "Without using technology, I can address the common misconceptions my students have for my first teaching subject." The results of the regression analysis showed that Singaporean teachers' were highly confident of their CK and C-PK. In contrast, their C-TPACK was less than five points and the lowest among the TPACK constructs. The study also highlighted that Singaporean teachers' perceptions of TPK, TCK, and TK had the largest positive relationships with their constructivist-oriented TPCK. The study (Koh et al., 2014) regression analysis has exposed that teaching level and teaching experience had significant influence on constructive TPACK among Singaporean teachers. Remarkably, the more experienced teachers perceived lower C-TPACK in this study.

With regard to teaching experience as a variable in examining teachers' TPACK or C-TPACK, research shows that more experienced teachers likely perceive TK, TPK, TCK, and TPACK negatively (Roig-Vila et al., 2015). Additionally, these teachers perceived lower self-efficacy in their overall TPACK in game-based PCK (Hsu et al., 2017). At the same time, novice teachers tended to be less confident when compared with their experienced peers in the knowledge of subject content (CK) and instructional strategies (PK) (Jang & Chang, 2016). Regardless of experienced teachers' lower confidence in their TK, they may possess more enthusiasm to incorporate technology into their instruction than less experienced teachers do (Saudelli & Ciampa, 2016). Age is another demographic variable that is discussed in examining language teachers' TPACK perceptions. In general, studies suggest that age may play a role for in-service language teachers' TPACK views. For example, older teachers tended to have lower self-efficacy of TK in some studies (Cheng & Xie, 2018; Hsu et al., 2017; Kazu & Erten, 2014) and in using the Internet for educational purposes (see TPACK scales in Lee & Tsai, 2010). However, Cheng (2017) did not find significant correlations between native teachers' age and their perceived TPACK. Perhaps, this difference can be explained by a mediating effect

of gender on the relationships between the native language teachers' age and their perceived TPACK.

These findings about demographic variables such as teachers' years of teaching experience and age imply several important research and practice opportunities. First, it can be implied that senior teachers can improve their ability to use technological tools as learning tools in classroom practice. Based on aforementioned research evidence, TK is an important factor influencing teachers' construction of TCK and TPK, and TPACK. Second, professional development programs about technology use in the classroom can influence the knowledge teachers inquire and acquire from (Cheng & Xie, 2018; Prasojo et al., 2020; Taimalu & Luik, 2019). These programs aimed to expose teachers for TPACK opportunities to help teachers reflect on their current technology integration practices and learn from their peers. In-service TPACK trainings, workshops, collaborative discussions, and school support system (trainings, access to digital tools) provide a space for teachers to exchange their experiences and resources to further enhance their teaching and learning practices and promote student learning (Mishra & Koehler, 2006; Habibi et al., 2020).

New evidence on teachers' TPACK, acting as a mediator, suggests the relationship between beliefs and lesson planning (product) (Deng et al., 2017). Literature on the belief-practice relationship might interpret this link by suggesting that teachers' TPACK (as an internal factor) might exert much more power on lesson planning in comparison to teachers' beliefs. Another explanation may lie in teachers' choice of selecting technology integration classroom practices based on their beliefs under consideration (Pajares, 1992) within teachers' belief system (Green, 1971). Detailed discussion of the relationship between teacher beliefs and teaching approaches is explained in Section 2.4.

Despite the recent increase in research of TPACK (Irwanto, 2021), there is a paucity of studies focused on the examination of TPACK among Hungarian, Kazakhstani, and Polish K-12 EFL teachers. The existing literature suggests that discussing the TPACK framework, modelling from experienced teachers, and engaging teachers in collaborative lesson planning aid the development of TPACK (Chai et al., 2019; Lai et al., 2022; Roussinos & Jimoyiannis, 2019; Tseng et al., 2020).

Another research opportunity is that teachers' TPACK is usually self-reported. To complement the lack of measuring teachers' perceptions of technology integration practices in language teaching, this study used teacher observations based on the teacher effectiveness model (Danielson, 2013). Suggested teacher observation as a research method (Brantley-Dias & Ertmer, 2013), this study examines how teacher knowledge is transferred into practice.

Therefore, one of the research questions of this study is to examine language teachers' strong and weak TPACK in three contexts, i.e., in Hungary, Kazakhstan, and Poland.

To sum up, this section has provided a comprehensive overview of the TPACK framework, elucidating its significance in understanding the intricate dynamics of technology integration within pedagogy across various educational contexts. As this study embarks on exploring language TE in OLEs and the pivotal role of families in supporting SL during crises such as the COVID-19 pandemic, the insights garnered from TPACK research serve as a crucial foundation. By delving into the relationship between different types of teacher knowledge, this framework offers valuable insights into how technology can be effectively harnessed to address the challenges faced in contemporary education settings. Moreover, opening up a discussion on teacher pedagogical beliefs and their impact on technology integration underscores the nuanced interplay between individual dispositions and instructional practices. As we move forward with this study, the synthesis of TPACK findings will not only enrich our understanding of language teacher effectiveness and student learning support but also pave the way for informed interventions and policy recommendations aimed at enhancing educational outcomes in online learning environments.

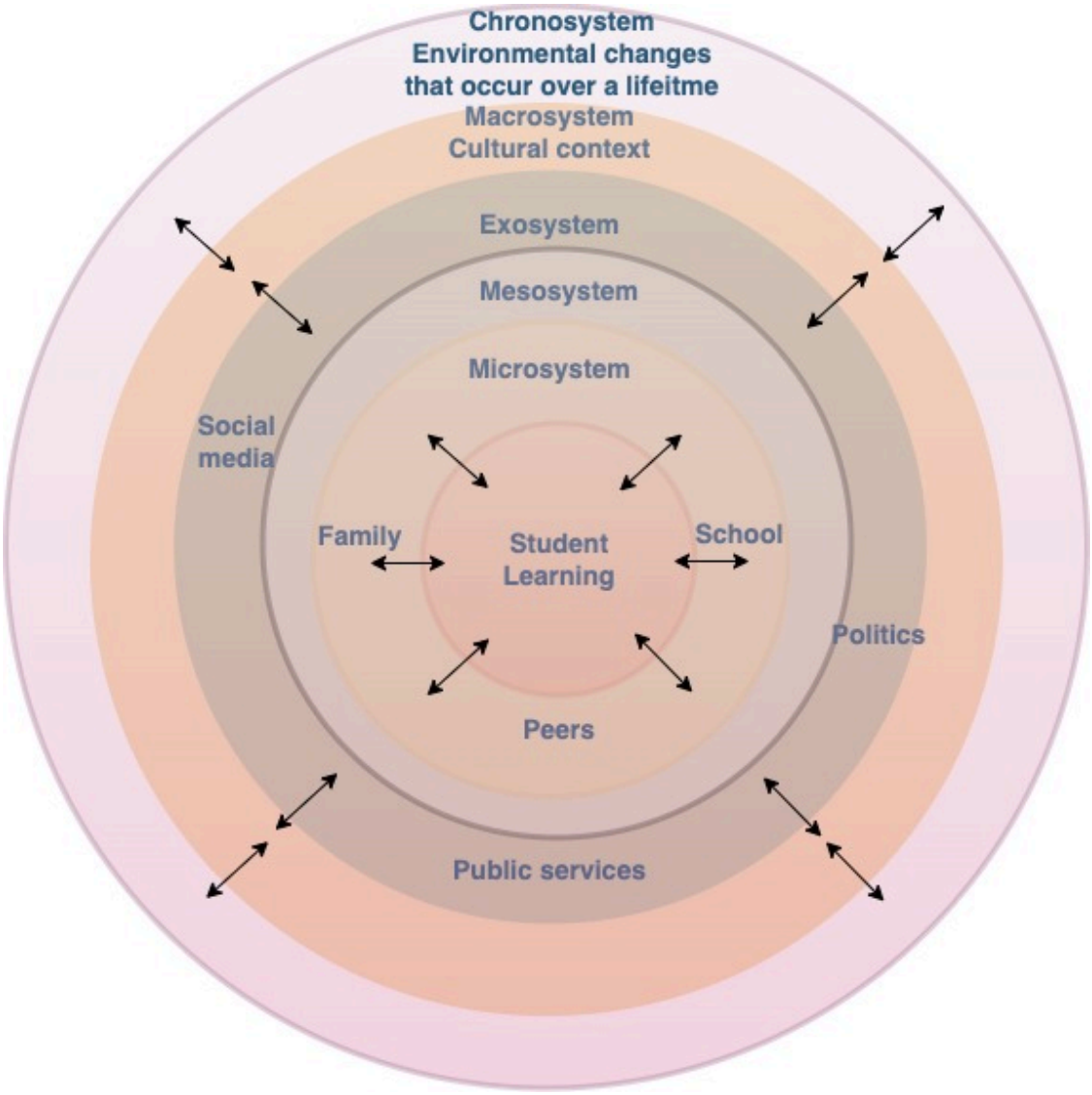
2.2.4 A Synthesis of Ecological, Socioeconomic, and Digital Perspectives

A theoretical framework exploring families' roles in supporting SL while locked in homes because of the pandemic incorporates Bronfrenbrenner's Ecological Systems theory (1979), Bourdieu's theory of (forms of) capital (1986), and the Digital Divide. In doing so, I attempt to shed light on the relationships between internal factors such as family backgrounds (SES, parents' financial, social, and cultural capitals), parents' beliefs on technology use for education) and external factors of the digital divide affecting SL. More specifically, the synthesis of these theories will illustrate how these factors create conditions to benefit SL or how they limit students' participation in educational experiences.

The Ecological Systems theory (EST) allows us to regard the extent of parents' effectiveness in supporting children's learning based on families' SES. This theory emphasises the importance of considering several levels of influence in understanding human development (Bronfenbrenner & Evans, 2000). Figure 5 depicts the relationships of multiple levels in EST.

Figure 5 Ecological Systems Theory adapted for the study

Original source: Based on Bronfenbrenner (1979)



Previous research identified parents' SES as a moderator of the effects of parents' involvement on children's achievement (Tomaszewski et al., 2020) and a provider of better access to cultural, social, and financial capital (Bodovski, 2019) for children. These results also support the argument that students in families with a higher income (Andrew et al., 2020) and better technologically equipped households for online learning were able to spend more time on learning from home (Rahiem, 2020).

Bourdieu's theory of the forms of capital and individuals' dispositions to act in a given field helps to convert social, cultural, and financial capital into social and economic advantages. In the context of this study, *cultural capital* refers to knowledge, skills, and cultural assets that

parents acquire during their educational and occupational experiences. This theory is valuable in the discussion of ERE because it highlights the importance of families' access and gains of various educational opportunities and resources. For example, Dimopoulous' et al. (2021) study, based on the second survey of schools: ICT in Education conducted on behalf of the European Commission (2019a), found that highly educated parents across European nations are a) more familiar with ICT use, b) use ICT for education, and c) regulate children's use of digital devices (p. 487). In contrast, some of the studies from the Global South continuously report about widening disparities between the rich and the poor and unfavourable conditions in accessing education during the COVID-19 (Dube, 2020).

The theory of *digital divide* proposes that there are economic and social gaps between large groups often at population levels of a nation and their access to technologies for information and communication purposes (van Dijk, 2005). The concept of digital divide refers to three levels of societal inequalities related to digital access, capabilities, and outcomes (see Figure 6). The first level of the digital divide reflects inequalities stemming from basic access to the hardware and internet connectivity required for online participation because of both infrastructure and economic cost (Hargittai, 2002; Resta et al., 2018; van Dijk, 2005, 2017). Rural, low-income, and disadvantaged students are more likely to experience challenges with access than their urban, affluent peers (Cleary et al., 2006; Hargittai, 2002). The second level refers to the differences in internet use (Hargittai, 2002). For instance, families with lower educational or financial backgrounds use the internet for entertainment purposes whereas families with higher educational or financial backgrounds use the internet for other purposes, for example, to find a job. Third level encompasses significant differences in internet use between individuals or social groups based on their digital skills (Hargittai, 2002). Research (Hargittai, 2002; van Dijk, 2005, 2020) concluded that uses of technology at population levels of a nation are linked to social and cultural capital, and social mobility. Hence, the term *digital inequality* has been associated with social inequality (Hargittai, 2002; Livingstone & Bober, 2005) that can be largely observed at the first and the second levels of the digital divide.

The synthesis of these theories for the purposes of this study demonstrates that availability of devices, access to, and use of technologies is defined by a variety of factors (such as education, digital literacy, culture, opportunity), structured by social powers, and socially influenced dispositions (Lemistre and Ménard, 2019). The Bronfrenbrenner's theory (1979) describes family-related concepts impacting child(ren's) development. The Bourdieu's theory provides a theoretical language to explain the dynamics of school-family relationships and the social positions within the differentially structured relationships. The Digital Divide

allows to contextualise specific conditions of organising online learning. In sum, the synthesis of these theories:

- helped to identify learning experiences, opportunities, and limitations occurring in home-based education created by the COVID-19 pandemic,
- allowed to see educational inequalities beyond the forms of traditionally seen capital (e.g., financial, or educational background of families) in societies.

It is important to note that a theoretical combination of different theories in this study had its advantages and disadvantages. To begin with, all theoretical frameworks in this study present the author with a challenge in viewing and discussing this study through ontological and epistemological lenses. While Bordieu's theory is grounded in a sociological perspective and a concept of the types of capital is central in this study, the Community of Inquiry model is quite pragmatic and constructivist. Furthermore, all theoretical references focus on different dimensions of education, i.e., CoI addresses the interaction between teaching, cognitive, and social processes in online learning environments; Bourdieu focuses on the social structures that influence educational equity and access; TPACK centers on the technological integration in teaching. However, as I was developing my study I was aware that this theoretical choice requires clarity in defining how each framework addresses distinct parts of the research problem. Therefore, ensuring theoretical coherence through maintaining consistency across frameworks as well as in analysisng, integrating, and synthesising data has been possible because of the following. Applying a suitable research design, keeping coding book, defining clear boundaries, justifying theoretical combination, and defining a clear output in the use of mixed methods parallel convergent design helped the author of this study carefully address challenges associated with the theoretical combination in this study.

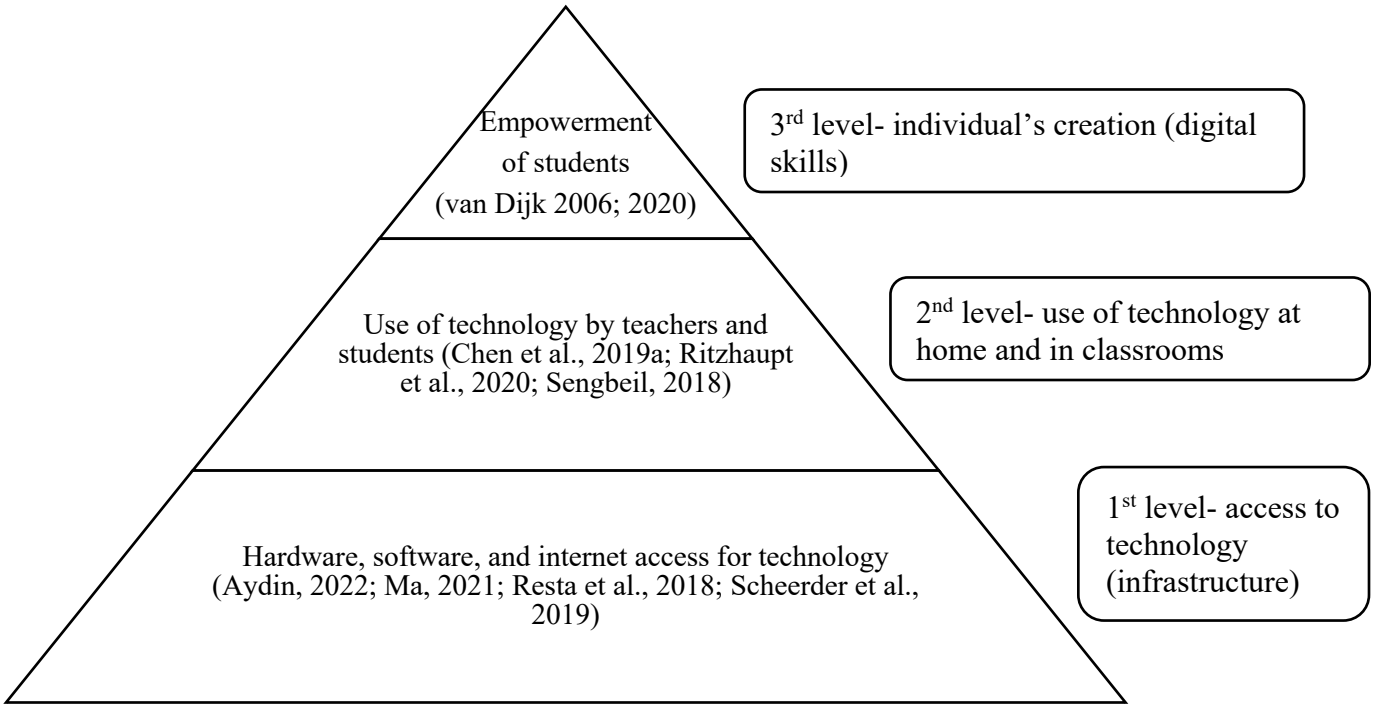
In conclusion, the synthesis of Bronfenbrenner's Ecological Systems theory, Bourdieu's theory of (forms of) capital, and the Digital Divide provides a multifaceted lens for understanding the intricate dynamics of family roles in supporting student learning in times of crisis. By synthesizing these theories, we gain insights into the complex interplay between internal factors such as socioeconomic status, parental beliefs, and cultural capital. Moreover, these theories highlight the disparities in access to educational opportunities and resources for all students. Amalgamating these theories extends our understanding of educational inequalities beyond traditionally recognized forms of capital. As we navigate through the complexities of home-based education in times of crisis, these theoretical frameworks serve as invaluable tools for identifying learning experiences, opportunities, and limitations, thereby

contributing to a deeper understanding of the intricate relationships shaping student learning outcomes in the context of crisis-induced shifts towards remote education.

In the next section, this dissertation defines key aspects of integrating EdTech in educational processes. Further, it discusses how other school stakeholders perceive the use of technologies in teaching and learning. It covers four groups of stakeholders: 1) policy makers in research contexts, i.e., in Hungary, Kazakhstan, and Poland; 2) EFL teachers; 3) students; and 4) families.

Figure 6 Levels in digital divide discussed in the reviewed literature for the purposes of this dissertation.

Source: Author's compilation of reviewed literature on the digital divide



2.3 EdTech integration in public education

This section clarifies the notion of digital education platforms (platform in short) widely used in secondary and higher education to illustrate the importance of studying digital education platforms. More specifically, as this dissertation explores how language teaching and learning was organised at the time of crisis such as the COVID-19 pandemic, it is critically important to understand a variety of dimensions that platforms bring into education. Namely, how architectural, intermediary, and organisational dimensions and investment into platforms

works, and what it means for education beyond being technologically 'colonised' area (Day et al., 2022; Decuypere et al., 2021; Landri, 2021). The section will not focus on technicalities of the dimensions but rather provide evidence of the enactment of digitalisation, as defined in section 2.3. It is intentional that I open up a discussion on the state of digitalisation of education before the pandemic in Hungary, Kazakhstan, and Poland as presented in section 2.3. Later in chapters 4 and 5 the discussion will continue as based on the empirical data collected and analysed for the purposes of this mixed methods convergent parallel study.

Defining digital architectures, intermediaries, emerging type of organisation in education, and investment into platforms

To define digital architectures means to consider the platforms as spatiotemporal constellations unfolding users' activities and bringing them into being while transactional data is created and circulated (Decuypere et al., 2021, p. 4). Composed by graphical user interfaces and application program interfaces, these software interfaces allow platforms and software modules interact with one another. For instance, digital education platforms such as Moodle or edX have APIs specifically tailored to provide unique sorts of learning, unique interactions between students and/ or teachers. Some of other platforms are embedded in a multitude of LMS integrating various features for technology-enabled language teaching and learning.

Intermediaries are platforms bringing together human and non-human actors to offer a use of a platforms regulating communication by a specific code of conduct and rules between users. Intermediaries participate in an enactment of a specific form of governance (Gorwa, 2019) by generating particular imaginaries of what education is and should be like, constructing and requesting new forms of educational expertise and professionality. In connection with this research imaginaries can be regarded as a professional staff member, not teachers per se, who ultimately come to decide how to design and conduct learner assessment, what education counts in digital platforms. This professional tech- and data- savvy staff member plays an equal role of a broker between digital platform in education and their end-users, i.e., students (Decuypere, 2019a).

Emerging type of organisation delivers learning data analytics, facilitate the exchange of educational content and activities, capitalises processes of data exchange, and is not involved in knowledge creation (Decuypere et al., 2021). For instance, growing amount of LMS, Google Classroom platform, class management platforms represent emerging types of organisation. Not all platforms that facilitate the exchange of educational content via data-driven decisions are uninvolved in knowledge construction. Some platforms such as Khan Academy or National

Geographic do not take up a brokering role and provide free content for various levels of education.

Investment into platforms equally contributes to educational practices to be visible, knowable, thinkable, and actionable (Decuypere et al., 2021, p. 7). For instance, class management platform Class Dojo enacts new ways about 'good' student behaviour and discipline through instant positive reward and feedback (gamification). It promotes and generates a new knowledge of what new classroom cultures of accessibility and safety could be imposing specific sorts of data-based 'truths' on the users, i.e., teachers, students, parents, schools, policy makers (Decuypere, 2019b).

In sum, these specific aspects of the digitalisation of education are vital to grasp an understanding of one of the study research questions. To restate, what pedagogical use of educational technology associated with remote, i.e., online teaching and learning school stakeholders (secondary school foreign language teachers, students, parents, and educational technology experts) perceive (research question 3).

2.4 Policy implementation in the digitalisation of secondary education

In this section I review policy makers' perceptions on the use of technology before the pandemic. The aim of this section is to illustrate how a need of creating and implementing technology use in classrooms has evolved in policies both at governmental levels and at school level. This is important to understand at this stage because later in the dissertation I will discuss policy implementation of technology use in schools from the perspective of language teacher beliefs and practices. This section is delimited to two factors. First, a discussion on policies on digitalisation in school education is situated in the pre-pandemic context. This intentional choice is important to illustrate how various school stakeholders, e.g., policy makers, teachers, schools, etc adopted technology use for teaching and learning before it became a new norm/ mandatory. Second, it is set for the European and Kazakhstani context for several reasons, each of which underscores the necessity and rationale behind this decision within the scope of the conducted research (see Chapter 1 for detailed explanation of the rationale).

To begin with, *digitalisation* in this dissertation is regarded as interrelated processes of privatisation, datafication, and platformisation. Educational researchers (Grimaldi & Ball, 2021; Landri, 2021; Cone & Brøgger, 2020) have contributed extensively to the empirical literature on platformisation. They claim that an alliance of EdTech business sector and public

authorities (e.g., schools, teachers) has expanded the space for the enactment of different economic forms through digital platforms, hence re-made education processes.

According to European researchers (Hartong & Förschler, 2019; Grimaldi & Serpieri, 2013), *soft privatisation* on one hand, contributes to the development of the network governance in the EU enabling policy-making bolstered by tech-providers and think-tanks. On the other hand, soft privatisation creates opportunities for private agents to perform public education operations such as school evaluations, curriculum design characterised by lesser extent of the state power as a regulator (Cone et al., 2022, p. 16). *Datafication* is a process of quantifying educational activities and knowledge interpreted via data analytics, monitoring, and prediction to govern education. *Platformisation* denotes a process where individual enterprises or networks engage in the 'systematic collection, algorithmic processing, circulation, and monetisation of user data' (Dijck et al., 2018, p. 4 as cited in Cone et al., 2022, p. 4). Taken together, these interrelated processes of soft privatisation, datafication, and platformisation encompass a concept of digitalisation of education as one of the foci explored in this research.

The history of digital competence established in European policy documents in the 21st century goes back to Lisbon Agenda (European Council, 2000) as the birth of e-government policies; to OECD (2005) that considered digital competence as a technical skill and the ability to use digital tools sufficiently.Various frameworks (see Ferrari, 2013) elaborated the views on this type of competence and the latest EU policy DigComp 2.2 (Vuorikari et al., 2022) provides an opportunity for educational institutions to develop certification programs recognising their students' digital skills (pp. 51-52).

Two other important frameworks to consider in the employability of technology in teaching and learning are ICT Competency Framework for teachers UNESCO (2018) and recent TALIS 2018[4] (OECD, 2019b) results. To date, 20, 5 % of teachers in Hungary and 30% of teachers in Kazakhstan reported a high level of need for professional development in ICT skills for teaching as compared to OECD-18% indicator. At the same time, seven out of ten teachers in Kazakhstan reported having "ICT for teaching" as part of their formal education or training, and almost all of them reported participation in professional development within the last year (OECD, 2019b). 65.7% of Hungarian teachers reported they 'felt well prepared' or 'very well prepared' in using ICT in teaching (OECD, 2019b). Yet only 48% of Hungarian

[4] No data is available in TALIS 2018 for Poland (OECD, 2020)

teachers reported they ‘frequently’ or ‘always’ let students use ICT for projects or class work. While the wording of the instrument (TALIS 2018) raises questions, the data on the Hungarian and Kazakhstani teachers’ ICT practices integrated in teaching suggest the need for more effective training for in-service teachers. As such, UNESCO (2018) ICT Competency Framework for teachers provides a comprehensive overview of standards for teachers to marry their teaching practices with technology effectively. It translates the multi-dimensionality of ICT integration to teaching via guidelines for teachers. The framework recognises teachers with varying degrees of use and experience of technology integration in classroom use and offers individual paths for teachers’ development of digital competencies. The–framework (UNESCO, 2018) includes 18 competencies distributed across six areas of teaching practice and three levels of pedagogical use of ICTs. The teaching practice areas are (1) understanding ICT in education; (2) curriculum and assessment; (3) pedagogy; (4) application of digital skills; (5) organisation and administration, and (6) teacher professional learning. Pedagogical use of ICTs by teachers illustrates levels of knowledge acquisition, knowledge deepening, and knowledge creation (see Appendix A). The UNESCO ICT Framework (2018) should not be seen as an independent tool in guiding ICT integration in teachers’ training at both pre- and in-service levels. As the authors of the document claim (UNESCO, 2018), the Framework aids the ICT inclusion in educational systems by providing foundational support for policy development and capacity building in ICT teacher training (p. 1).

The upcoming sub-section argues that although the existing national digital education policies in Hungary, Kazakhstan, and Poland have taken measures to create opportunities to bolster teachers’ and students’ ICT skills, the measures are insufficient. The measures include launching national digital education strategies, diversity of offering e-educational resources in schools and to the wider population, and administrative databases to log educational data (Sosa-Diaz et al., 2022). Nevertheless, these measures lack a methodological and training knowledge base for the pre- and in-service teachers which does not lead to better learning outcomes for school students (OECD, 2015).

Hungary: Digital policy measures and programs in the public education domain pre-pandemic

In line with the European Parliament (2018) directive on digital transformation of education, Hungarian primary and secondary schools meet the standards of most EU countries in owning a digital device (EU, 2019b). However, an examination of how the usage of devices affected student learning received little scrutiny (OECD, 2014). For example, according to

PISA 2018 survey results only 26% of Hungarian students reported using ICT during test language lessons together with teachers compared to 37% across OECD countries (OECD, 2019a). Furthermore, students in Hungary used digital devices during and outside classroom language lessons for 26 minutes a week compared to 41 minutes across OECD.

In 2016 the Hungarian government launched Digital Education Strategy (DES) (Magyarország Digitális Oktatási Stratégiája, 2016) enabling students at all educational levels use digital educational tools. However, the Centre for Digital Pedagogical Methodology (Digitális Pedagógiai Módszertani Központ), the main responsible body for the implementation of Hungary's Digital Education Strategy, limited activities to the development of regulatory instruments and to piloting small-scale experimental projects. As such, E- KRÉTA, an online administrative registry platform, was introduced in all public schools in 2016. Based on teachers' reports', E- KRÉTA did not support teachers in the development of their digital competencies and teachers mainly used it for grading and tracking homework assignments (Monostori, 2021).

The current policy framework DES (Magyarország Digitális Oktatási Stratégiája, 2016) in relation to public education, lacks fundamental methodological and organisational support for teachers. One of the notable shortcomings of the framework is a lack of a national system of digital competence assessment and ICT qualification framework for teachers (p.8). Levels 1 and 2 of the Digital Divide affect students and teachers in their use of technology in classrooms creating barriers in information sharing and content creation enabled by technologies and imposing administrative burden on teachers and school administration. Additionally, teachers reported on the divide in the distribution of the internet access because of the regional diversities as one of the reasons of not using technologies in the classroom (DES, 2016, p.8). As a result, the rate of the usage of available ICT was low and teachers did not feel confident in using technology in their classroom practices. Although the NCC prescribes the transfer of digital competences as an output target, teachers pointed out to some larger issues restricting their use of technologies in classrooms. Restrictions included the lack of consistency in guidelines of the usage of technologies in the classroom, teaching materials, instructions, and the lack of technical infrastructure to embed technology into teaching and learning (ibid). Some scholars proposed that providing methodological support for pre-service teachers on technological and pedagogical knowledge might be a solution to promote effective teaching and learning (Fekete, 2020). Others (EU, 2019a) offered technological pedagogical content knowledge development programs for in-service teachers.

It can be suggested that the commonality of standards for digital education in schools at the European level supported by DigComp 2013-2022 (Carretero Gomez et al., 2017; Ferrari, 2013; Vuorikari et al., 2016; Vuorikari et al., 2022) can assist Hungarian schools. Specifically, to frame digital competences related to the teaching profession (Redecker, 2017) with regards to the local context, level 1 and level 2 concerns of the Digital Divide. These efforts as well as investing in a digital infrastructure for education purposes can further support the digitalisation of education strategy in Hungary (OECD, 2023).

Kazakhstan: Digital policy measures and programs in the public education domain pre-pandemic

Available literature on the Kazakhstani policies in equipping schools with computer hardware, software, and Internet connection demonstrates country efforts to modernise secondary education and encourage the school system to improve equity goals (MESRK & IAC, 2017). For this reason the State Programme of Education Development in the Republic of Kazakhstan for 2011-2020 (Ministry of Education and Science of the Republic of Kazakhstan, 2010) outlines country ambitions on providing opportunities for distance education in different aspects. For instance, in 2013 Kazakhstan launched the National Education Database (NED) to collect and analyse administrative data on all levels of education inviting regional educational authorities to observe and confirm available data (IAC, n.d., p. 75). NED integrates their activities with local digital learning solutions such as Kundelik, Bilim Land, and Online Mektep.

Kundelik is an online registrar for public schools across the country that parents can use to view their children's home assignments and academic grades, and exchange feedback with subject teachers. Bilimland.kz and Online Mektep are similar to Massive Open Online Courses (MOOCs) oriented at primary, secondary, and high school students. These online platforms provide students with various media content and supplementary materials for teachers such as lesson plans or activity subject sheets. The materials are aligned with school curriculum and the requirements of the State Compulsory Education Standards of the Republic of Kazakhstan (IAC, 2020, p. 79). Additionally, the country has invested in producing e-textbooks and had it available as open access at bilimland.kz, itest.kz, twig-bilim.kz and imektep.kz (ibid). Nevertheless, the country experiences technological infrastructure challenges and Internet connectivity hindering initiatives in equipping schools for providing education virtually, especially in rural areas.

According to the national data, 70% of public schools located in rural areas out of 98.5% nationally had broadband access in 2018 (OECD, 2020a). Ministry of Education and Science of the Republic of Kazakhstan recognised the insufficient technical support and the lack of broadband Internet in specifically rural schools and attempted to bridge the gaps for rural students. For example, a student to computer ratio in 2019 was 11:1 (IAC, 2020, p. 78) and in 2020 it was 6:1 (IAC, 2020, p. 68). Nevertheless, policy implementation on distance learning has repeatedly shown gaps between planned outcomes and failures in achieving them, mainly because of the failure of actors (Bokayev et al., 2021). Specifically, the country lacks legislative justification of providing distance learning to all public school students disregarding their family status, geographical location, linguistic background. Similarly to Hungary, Kazakhstan lacks methodological and organisational guidelines for higher education institutions nationally. Professional development for secondary education leadership bodies including boards of trustees to integrate technology in classrooms seems to be lacking as well (IAC, 2021, p. 70).

Poland: Digital policy measures and programs in the public education domain in the context of changes after 2015 parliamentary electoral campaign to the pre-pandemic times

The government of Poland introduced a range of policy initiatives in an attempt to enable digitalisaton of education. To begin with, the nationwide pilot program called Digital Poland (Polska Cyfrowa) aimed to strengthen students' and teachers' ICT competencies (Marzantowicz, 2016); educational platform NAVOICA offering MOOC courses developed by local universities and educational institutions, coordinated by the Ministry of Education and Science. Non-governmental organisations (NGOs) such as Fundacja Nowoczesna Polska, Orange Foundation Poland and technology corporations such as Samsung: Mistrzowie Kodowania and Apple educational programmes offered their courses, tools, and solutions free of charge (Szyszka et al., 2022).

However, according to Plebańska and her team (2017), teachers complained about the quality of school equipment, outdated hardware and software, lack of funds to purchase new equipment and applications, lack of technical and methodological support, and lack of time to prepare digital teaching resources. Their findings can be corroborated with PISA 2012 and PISA 2015 results of the decrease in digital competencies among Polish students. As Jakubowski (2014) posited, traditional teaching methods were prevailing in Polish schools despite the availability of modern computer labs and portable devices.

The digitalisation of schools in Poland faces challenges similar to Hungary and Kazakhstan. The vagueness of conceptualisation of policies in respect to defined equipment standards, standards related to digital educational resources (Tarkowski & Plebańska, 2019), defined and elaborated digital competence of teachers in technological pedagogical and content skills (p.11), lack of unconstrained internet access restrict the digitalisaton of education. These limitations cause obstacles for schools, teachers, and students to use technology in schools and classrooms to achieve the primary goals of education. For example, drawing on the data from the Digital Economy and Society Index (European Commission, 2019c), Poland lags behind some of the EU countries in terms of next generation access (NGA) technologies with about 75% coverage in urban areas and around 30% in rural areas with disadvantaged Eastern regions as compared to the EU average at 86%.

Despite the falling rates in the spectrum of the digital competences defined by the DigComp among Polish school students and teachers, it can be concluded that Poland makes efforts to compensate for the gaps (Nowak, 2019). For instance, adding the basics of informatics in early school education (Sysło & Kwiatkowska, 2015) to the basics of programming in the IT core curriculum or offering MOOCs to wider groups of population (Szyszka et al., 2022).

In light of the above, policy initiatives in Hungary, Kazakhstan, and Poland have initiated steps in raising the level of digital competencies of students and improving teachers' skills in the effective use of technologies in the classroom. As it was mentioned above, policy initiatives included strategic programmes in conceptualising the digitalisation of school education to some extent. These programmes included the development of digital educational resources such as textbooks, lesson plans, and MOOCs aligned with the national core curriculum standards to some extent. Another policy initiative observed in three countries refers to the launch of digital learning platforms that students, teachers, and parents can access outside schools and exchange communication with each other. International studies such as PISA, TALIS, and PIAAC play an important role in conceptualising specific teacher digital competencies and student ICT competencies. As such national governments of Hungary, Kazakhstan, and Poland have addressed to some extent the deficiencies of ICT competencies and usage of technologies as evidenced in studies of IAC (2020, 2019, 2018), Jakubowski (2014), UNESCO (2018).

The knowledge of policy initiatives and policy makers' perceptions in Hungary, Kazakhstan, and Poland is important in laying evidence-based foundation in understanding research question 4 of this study: What are school stakeholders- secondary school foreign

language teachers, families, students, and edtech experts- perceptions on the pedagogical use of technology in remote, i.e., online learning?

2.5 Barriers and enablers in teacher technology integration practices

This section delves into empirical findings of EFL teachers' internal and external barriers in integrating technology for language teaching and learning purposes before the onset of the COVID-19 pandemic. Specifically, this section discusses three major points. First, how teachers' beliefs and attitudes towards EdTech integration in language teaching relate to teachers' technology integration (TI) practices in classrooms. Second, what role professional development and training play in shaping EFL teachers' perceptions toward EdTech integration in language teaching and learning. Third, how the use of EdTech affects classroom dynamics, student engagement, and teachers' decisions to use technologies for learning purposes in classrooms. This section concludes with a reflection on the literature and their implications for the present study.

Internal and external barriers in teacher technology integration teaching practices

Research conducted in a variety of K-12 education (Bereczki & Kárpáti, 2021; Farjon et al., 2019; Hsu, 2016) demonstrates the importance of including teachers' beliefs in examining teachers' TI classroom-based practices. Recent and past studies examining TI practices in classrooms indicate that teachers' beliefs strongly influence teachers' decisions to integrate technology in classroom teaching. For instance, recent meta-ethnographical synthesis of qualitative research about teachers' beliefs (Mertala, 2019) found that pre- and in-service teachers held *positive* and *negative educational beliefs* about integrating technology in early childhood education. Positive educational beliefs found in 23 studies linked the benefits of using technology to students' academic performance, attractiveness of multimedia presentations, allure of digital learning games, child-centred learning, and the development of children's learning skills (e.g., self-regulation). In contrast there were some studies (Cheng & Xie, 2018; IAC, 2021; Semjen et al., 2018) illustrating that some teachers believe that traditional methods and materials are more effective.

Empirical evidence has lent support for positive educational beliefs, also referred to as *teacher pedagogical beliefs or constructivist beliefs* in Ertmer's (2005) seminal work. Indeed, decades of research (Hermans et al., 2008; Liu et al., 2017) confirm that teacher pedagogical beliefs positively influenced whether and how frequent teachers used technology for student-centred learning, in contrast to negative beliefs. Early studies indicated that teachers possessed *enacted* beliefs and *espoused* beliefs as represented by classroom technology practices (Ertmer

et al., 2012). That is, teachers with constructivist beliefs were observed in using technology in traditional ways. For instance, recently, Ding et al. (2019) analysed how EFL teachers, having access to technology and using it, e.g., Power Point, movie maker, Padlet, QR, voice memo, Kahoot, and others, primarily used it for information presentation purposes. In skill-based practices some EFL teachers used technology for drill practice and memorisation of words (p.10). In rule-based practices some EFL teachers used technology to support grammar presentation and practice (p.10). In function-based practices with technology some other EFL teachers employed technology for engaging communicative activities with rich vocabulary (p.11). These uses of ICT based on content specific pedagogical beliefs provide a stronger rationale into language teachers' instructional practices involving TI. That is, Ding et al.'s study (2019) expanded the understanding of teacher pedagogical beliefs and TI practices pointing out to the language specific belief orientations.

Much of the teachers' beliefs and TI practices builds on Ertmer's (1999) seminal work identifying disparities between these two constructs. Ertmer (1999) states that external and internal barriers, which she coined as first-order and second-order barriers, directly influence teachers' technology use decisions. *First-order barriers* (Ertmer, 1999) refer mainly to the level 1 of the Digital Divide and second-order barriers are internal to the teacher. *Second-order barriers* refer to teachers' attitudes towards technologies, openness to change, and comfort with established classroom-based practices (Ertmer et al., 2014, p. 420). In sum, first- and second-order barriers are complex, and both have direct influence on teachers' TI practices. Most importantly, they do not interact with each other (Ertmer, 1999). Using Ertmer's (1999) language, second-order beliefs are of a greater challenge (Durff & Carter, 2019; Zehra & Bilwani, 2016) while first-order barriers prevent teachers to a certain extent in their TI practices (Cheng & Xie, 2018; Francom, 2019).

In solving second-order barriers to integrate technology in K-12 language teachers' practices some solutions have been identified in past and recent studies (Ertmer et al., 2012; Vongkulluksn et al., 2018). Namely, teachers' inner drive, administrative support, and personal beliefs were found as the most influential. For example, Ertmer and colleagues (2012) in their seminal study examining 25 and 12 award-winning technology-using teachers respectively identified the relationship between teachers' knowledge of technology and teacher beliefs. Specifically, they suggested that teachers' knowledge of how technology supports SL have the potential to change teachers' attitudes and beliefs. This finding can be further elaborated that change in teachers' beliefs may be achieved with teachers' growing understanding of the 21st-century student and changes in the K-12 curriculum related to the 21st-century teaching and

learning. The calls for advancing teacher education to meet the needs of students in the 21st-century have been announced by international programs (Fraser, 2019). As documented in the previous TALIS 2018 study (OECD, 2019c), 18 % of teachers in public education across OECD countries expressed that they needed professional development on using ICT skills in their teaching.

More recently, research and theory has suggested that teachers do not always strictly follow their enacted beliefs. Rather, they blend teacher-centred and student-centred pedagogical beliefs in their practices (Vongkulluksn et al., 2018). Building on a voluminous research on teachers' beliefs and TI, Kopcha with colleagues (2020) suggested that teachers' decision to integrate technology is 1) value driven, 2) embedded in a dynamic system, and 3) a product of a teacher's perception of what is possible. This research asked a question: why do teachers continue to enact teacher-centred technology practices amidst an increase in technology access? Authors (Kopcha et al., 2020) expanded de Koster's et al. (2017) perspective of teacher's consideration to use technology in the context of dynamically changing teaching and learning without focusing on specific pedagogical orientations.

Indeed, rapid changes in hardware and software, in teaching and learning increase the barriers for some teachers and schools. Expanding Ertmer's (1999) definition of first- and second-order barriers in teachers' TI practices, European Commission (2019a) further details barriers as equipment-related, pedagogy-related, and attitude-related obstacles that hinder teachers' TI practices. In their 2nd Survey of Schools: ICT in Education (European Commission, 2019a) carried out in 31 countries (EU28, Iceland, Norway, and Turkey) teachers perceived the insufficiency in the availability of tablets, laptops, and notebooks as the most important obstacles to the use of digital technologies at schools (p. 2). The survey also urged about the importance of continuous professional development for teachers towards TI. This section will detail this perspective later below.

Given the disadvantages for accessing and providing education that come along with the levels of the digital divide (discussed in section 2.2.4) involving technology for learning, some research (Cheng & Parker, 2023; Teo et al., 2018) illustrated how schools and teachers could overcome different types of barriers. This research (ibid) reports on successful technology integration with classroom practices benefitting SL. Namely, teacher collaboration, school policies have been identified as aspects enabling teachers to overcome first- and second-order barriers (Ertmer, 1999).

In reviewing empirical findings examining second-order barriers impeding TI practices teachers' student-centered beliefs were significantly and positively associated with teachers'

predicted intention to use ICT in classrooms (Cheng & Parker, 2023; Teo et al., 2018). This is connected with teachers' attitudes to which we now turn.

Role of teachers' attitudes in technology integration teaching practices

In addition to teachers' beliefs, teacher attitudes also play an important role in predicting teachers' adoption of technology use. Empirical evidence lends support to the importance of attitudes in the process of TI. Indeed, in Scherer and Teo's (2019) meta-analysis attitudes were found as significant predictors of teachers' intentions to use technology. Most of the studies examining teachers' technology adoption via measuring teachers' attitudes such as technology self-efficacy rely on using several frameworks. TPACK or the Technology Acceptance Model (TAM) (Davis, 1989) are among the most frequently used frameworks. In alignment with these theoretical frameworks, a considerable amount of research (Li et al., 2019; Njiku et al., 2019) has been conducted to investigate how attitudes determine the use and the intentions to use technology among teachers. While some research (Li et al., 2019) illustrated characteristics of teachers with high scores of TI in teaching practices, other research (Njiku et al., 2019) reported about a difference in measured constructs of attitudes. Specifically, the authors (Njiku et al., 2019) noted that reviewed literature measured attitudes in three domains: affective, behavioural, and cognitive. Hence, it can be concluded that available literature on teachers' attitudes in relation to TI measures a wide spanning of constructs aiming to explain the relationship between the two.

Interestingly, another study by Raygan and Moradkhani (2022) showed how both TPACK and attitude hold significant direct positive relationship with TI. Their study expanded Li et al.'s (2019) study findings pointing that attitudes served as a mediator between school climate and TI. More specifically, factors such as institutional support led to create positive attitudes among teachers to integrate technology to teaching practices. A discussion of how institutional support in schools including professional development and training shape EFL teachers' perceptions about TI will be continued in the next section.

Teachers' attitudes explain a degree of teachers' use of computers in classrooms in connection with the value belief system. Some recent research (Vongkulluksn et al., 2018) showed that when teachers lacked belief in the value of technology presence in SL, teachers were less likely to use computers in classrooms. In practice it means that teachers with higher value beliefs about TI and higher confidence and experience using technology display higher technological knowledge and actively work around lack of access to technology. For instance, these type of teachers may bring their own device for use in the classroom, spend more time to

find a matching software for the curricular needs (Cheng & Xie, 2018; Ertmer et al., 2012; Vongkulluksn et al., 2018).

Furthermore, teachers' attitudes towards TI have been found to shape classroom dynamics and student engagement (Hartman et al., 2019) although the majority of this has been focused on higher education (Jääskelä et al., 2017; Marcelo and Yot-Domínguez, 2019). *Student engagement*, being a meta-construct, refers to the time and energy that learners purposefully dedicate to learning activities (Kuh, 2003). It encompasses students' engagement in different types of behaviour, cognition, and affection (Bond, 2020; Fredricks et al., 2004). Table 1 summarises some of the indicators of student engagement.

Several studies concluded that when teachers employ and regularly use technology for learning purposes in K-12 classrooms, student engagement prevails in online learning (Asiri, 2019; Bedenlier et al., 2020; Sun & Hsieh, 2018) with subject curriculum learning resources being technologically-enhanced (Mirzajani et al., 2015). In their systematic review Bedenlier and the team (2020) concluded that both behavioural and cognitive engagement contribute to effective online learning. Authors suggested that teachers should consider student perspectives, provide space for student autonomy and support in OLEs. Support was offered to teachers to consider tools in alignment with the level of tasks and arranging technical support in par with engaging students emotionally (see indicators of affective engagement in Table 1).

Table 1 Indicators of student engagement

Based on Friedricks et al. (2014) and Bond (2020).

Behavioural engagement	Cognitive engagement	Affective engagement
Setting learning goals	Preference for challenge	Enthusiasm
Time on task/persistence and effort	Flexibility in problem solving	Belonging
Study habits	Positive coping in the face of failure	Curiosity
Self-regulation	Focus on learning, striving for knowledge	Sense of well-being
Homework completion	Self-regulation	Positive interactions with peers and/or teacher
Self-directed academic behaviours	Strategic learning (use of a variety of learning strategies such as rehearsal, summarising, elaborating the understanding of a learning material)	Value (appreciation of success in school-related outcomes)

Interacting with peers and/ or teacher Participation/ involvement in school/ class-related activities	Positive self-perception and self-efficacy	Interest (enjoyment of an activity) Utility value (importance of the task for future goals)

In addition to teachers' beliefs and attitudes, school support influences teachers' decisions and intentions to integrate technology for learning. Empirical evidence, as discussed in the next section, provides justification as to why school support and orientation towards promoting training for teachers on TI adoption support teaching and learning.

Institutional enablers in shaping EFL technology integration teaching practices

School support interpreted by teachers as professional development, technology availability and accessibility, technical support to troubleshoot technical difficulties in teachers' TI practices change teachers' beliefs regarding the use of technology for learning purposes. Evidence (Adnan et al., 2024; Bowman et al., 2020; Ertmer & Ottenbreit-Leftwich, 2010; Francom, 2020; Lai et al., 2022; Picton, 2019; Samatova, 2019; Tosuntas et al., 2019) stress on the role of these kinds of support to teachers that also contribute to eliminating first-order barriers (Ertmer, 1999) discussed above.

However, providing only technical support and infrastructure is insufficient in equipping teachers with digital literacy skills and exposure to TI for student-oriented learning environment. Building and promoting a culture to embrace changes and innovation with new technology is important as well (Durff & Carter, 2019; Li et al., 2019). Furthermore, it was discovered that when teachers felt and acted autonomously, teachers were able to successfully overcome barriers to TI (Durff & Carter, 2019, p. 251).

In regard to continuous professional development (CPD), according to the 2nd Survey of Schools: ICT in Education (European Commission, 2019), support is crucial to equip teachers with necessary skills and knowledge to bolster their TI practices in teaching. Therefore, to boost teachers' digital competence, the Commission (2019) recommends integrating successfully established tools such as eTwinning, School Education Gateway, and Teacher Academy in the curriculum in teacher training and in on-the-job learning. In other words, there is clearly a need for education to further support teachers through all forms of professional development in equipping their skillset for TI in teaching. This support can go beyond traditional formal CPD programmes, mentoring, online resources and teacher

collaboration to further include informal learning environments, as evidence suggests (Dilion et al., 2019).

2.6 Role of home dynamics, parental involvement, and socio-cultural contexts in technology use at home for learning purposes

This section discusses families' perceptions on children's use of ICT facilitating in achieving the aim of this doctoral study. That is, to build a comprehensive understanding of how families' roles have changed with regards to their involvement in remote student learning during the pandemic in Hungary, Kazakhstan, and Poland.

Parental involvement (PI) in children's education is a multi-dimentional notion, and in this study, I focus on PI in children's application of ICT for EFL learning purposes at home and in school. PI has been widely studied from a range of both theoretical and empirical knowledge investigated since the 1960s (Brooks- Gunn et al., 2000). Recent studies demonstrated how education policies fostered the growth of studies of PI in children's learning in different contexts (see Antony-Newman, 2019 for Ontario, Canada; see Hornby & Blackwell, 2018 for the UK; see Lara & Saracostti, 2019 for Chile).

Research findings illustrated that PI in children's use of technology for learning at home has been one of the most important predictors to support K-12 students' educational success (Chen et al., 2019b; Hammer et al., 2021). Specifically, patterns connected with home factors such as availability of computers and access to educational resources at home, parent beliefs and parents' digital literacy influence children's usage of technologies, including MALL, for learning (Sanchez-Martinez & Ricoy, 2018; Livingstone & Byrne, 2018).

Furthermore, studies (Bartau-Rojas et al., 2018; Tsuei & Hsu, 2019) clarified differences in research results involving parents as mediators in children's use of technology at home for learning. Some parents perceived technology use in education to benefit teaching and learning engaging (Ihmeideh & Alkhawalden, 2017; del Carmen Ramirez-Rueda et al., 2021). Parents believed that students' use of technology in and outside the classroom increases students' motivation to learning (Sanchez-Martinez & Ricoy, 2018). Parents also viewed technology as a tool to enable children to search for academic and job opportunities (Carmen Ramirez-Rueda et al., 2021). This view was also supported by teachers who jointly with parents viewed technology as an entertaining tool and for learning (Sanchez-Martinez & Ricoy, 2018).

However, some other families believed technology negatively impacts children (Chang et al., 2019); parents felt concerned about children's ICT use (Keane & Keane, 2018); ICT shouldn't replace traditional teaching in parents' views (Fereire & De Napoli, 2008). In addressing some of these parents' concerns, some policy makers proposed national programs

for families in encouraging technology use with their children (Isikoglu Erdogan et al., 2019; van der Vlies, 2020). Their suggestions were centred around having an educational plan for schools involving parents to develop and implement school digital transformation. However, some families viewed technology as risk for them (Echeverria, 2008). The 'generation gap' between the parent(s) and child, and parents' economic and cultural capital shapes families' experiences of using technology (Hollingworth et al., 2011) making some families feel uncomfortable about guiding their children's ICT use (Plowman et al., 2010). Nevertheless, other families felt they were able to supervise technology use by children at home (Hérnandez et al., 2014).

Research findings insist on the family and school collaboration to integrate technology-based learning. Scholars suggested that parents and teachers needed to work together to promote the responsible use of technology (Monks et al., 2016). In contrast, there is another literature saying there are no differences between the responsible use of technology at home or at school (Gudmundsdottir et al., 2020). More intense collaboration between parents and school is needed (Tejedor & Pulido, 2012).

Growing evidence on the PI shows that digital education will depend, to a greater extent, on parents and what happens in schools, and their collaboration (Bartau-Rohas et al., 2018). In the 21-st century parents and children's digital education is important (Urias et al., 2017) and understanding of parents' degree of commitment (Vittrup et al., 2016). Parents' support of their children's ICT use in teaching and learning has to be undertaken by a school-parent relationship with the responsibilities' distribution between them in teaching and learning (Kong, 2018). That is, families need to be involved in the transformation of teaching and learning and ICT use. Otherwise, families might be an obstacle to the child's relationship with technology (Hérnandez et al., 2014).

Child(ren)'s age determines how early parents appeal to introducing technology devices such as tablets or smartphones for various purposes (e.g., play or language learning) at home. In general, children's technology use under the age of eight is mediated by parents. In a recent study (Isikoglu Erdogan et al., 2019) parents from diverse cultural and geographical backgrounds reported that their children's daily screen time was between two to four hours. While all parents reported in the study (Isikoglu Erdogan et al., 2019) that their children aged four to six watched TV, the use of tablets and iPads was mentioned by the US, Turkish, and Chinese parents. In contrast, South Korean children used smartphones the most after the TV (p.134). While this amount of time seemed increasing from a country to country, the study participants reasoned it with potential future educational benefits. Benefits such as functional

literacy in math and reading and learning about the world via digital play outweighed other concerns. Some parents in the study (Isikoglu Erdogan et al., 2019) viewed digital play causing potential health concerns, content concerns, and addiction concerns among children. Contrastingly, parents with a college-level education opted for a less frequent digital play for their children than parents without the degree. It can be suggested that family background plays a role in the way parents use technology tools to educate, entertain, and manage their children. As discussed above in section 2.2.4, the digital divide among children with varying degrees of family backgrounds such as SES, parents' educational attainment, and occupation is prevalent at different levels.

Technology access, social class, parents' breadth of digital skills, and children's experience with using technology are also predictors for adolescents' technology use practices at home (Chen et al., 2019; Masanet et al., 2019). For instance, MALL research indicates the effectiveness of mobile applications to differentiate instructional support, enhance students' motivation and engagement, and diversify types of informal language learning among teenagers in both Western and Eastern cultural backgrounds (Chen et al., 2017; Chen et al., 2019). In a Spanish study the authors (Masanet et al., 2019) found that Spanish adolescents acquired some complex and professional skills because of using a certain type of media. As such, YouTube, being an informal learning environment for many teenagers and young adults, enabled teenagers to practice their production and photography skills. As explained in section 2.2.4, content creation refers to Level 3 of the digital divide linked to social and cultural capital (Bourdieu, 1978). This group of learner, being able to incorporate digital technologies' use in their daily life in accordance with their knowledge, skills, and interests, is largely conditioned by their specific positioning in the social structure. On one hand, technology enables one's opportunities by transforming existing digital skills into a new form of learning outcomes. On the other hand, technologies increasingly create social exclusions given widening digital divide gaps. Quoting Ragnedda (2017) "inequalities born with the introduction of new ICTs will add to those already existing, in a circular and cumulative process" (p. 21), this doctoral study explores some of the factors mentioned above in specified research contexts (see Chapters 4, 5, and 6 for more details).

2.7 Research gaps

Existing research recognises the critical role played by schools in providing ICT equipment, implementing effective professional development programs and encouraging teachers and instructional designers to communicate about the effects of TI on teaching and learning (Durff & Carter, 2019), implementing a coherent technology-assisted curriculum (Li

et al., 2018), and focusing on improving the beliefs and attitudes of teachers (Pourhosein Gilakjani & Rahimy, 2020). However, less is known about examining factors or EFL teachers' perceptions in overcoming barriers toward TI in language classrooms. Additionally, past research states (Hew & Brush, 2007; Hsu, 2016; Li et al., 2019) to supplement survey data with observational data to measure teacher use of technology more objectively.

Given the known barriers and limitations associated with the pandemic and the digital divide, this research attempts to explore how EFL teachers integrated EdTech in language teaching and learning. In achieving it, this research examines EFL teachers' TPACK in Hungary, Kazakhstan, and Poland, and observes the extent of TI in the EFL teachers' sample remote teaching practice.

Therefore, this dissertation poses the following research questions sufficing the needs of the research design of this study:

RQ1: What is foreign language schoolteachers' strong and weak TPACK-21? (Technological Pedagogical and Content Knowledge)

RQ2: What is the relationship among social presence, teaching presence, and cognitive presence of the Community of Inquiry as reported by school students?

RQ3: What are school stakeholders' (secondary school foreign language teachers, students, parents, and educational technology experts) perceptions on the pedagogical use of technology in remote, i.e., online learning?

RQ4: How do school students, teachers, and families live through the shift in traditional boundaries in learning environments?

RQ5: What challenges did teachers experience in switching to an emergent remote teaching and learning?

Mixed methods question: To what extent, if any, did the combination of survey research, in-depth interviews and classroom observations provide a more comprehensive understanding of teachers' and families' roles in supporting students' learning and maximising teacher effectiveness in Hungary, Kazakhstan, and Poland?

2.8 Chapter Summary

To sum up, technology integration in language teaching and learning in classrooms has various internal and external barriers at a teacher and school level. Additionally, technology use at home for learning purposes is moderated by parents' beliefs about technology use, their forms of capitals (e.g., educational, linguistic, financial), and an extent to access and provide digital tools to children. Furthermore, some evidence (Adnan et al., 2024) illustrated that teachers' beliefs and attitudes are a strong indicator of how open teachers are and how often

teachers employ digital tools in their own teaching. Thus, according to the available evidence (Adnan et al., 2024; Fekete, 2022), language teachers' lack of strong technological pedagogical and content knowledge hinders their ability to serve as role models for students in utilising technology for learning.

Importantly, the implementation of educational policies impacts the digitalisation of school education. National policy initiatives related to the digitalisation of public education in Hungary, Kazakhstan, and Poland pre-pandemic have already signalled a lack of efficiency in teacher training and preparation for the digital component in language teaching and learning (DES, 2016; IAC, 2021; Jakubowski, 2015; Plebańska, 2017). This lack was translated to insufficient components of expanding teacher knowledge in the technology domain and in strengthening pedagogical content knowledge embedded in technological knowledge. Furthermore, teachers were unaware and untrained in considering the extent of social presence, cognitive presence, and teacher presence in promoting student learning online during an emergency COVID-19 pandemic situation. Therefore, investigating how educational technologies strengthen teacher effectiveness in online learning environments and what role language teachers and families played in supporting student learning during the pandemic stands out as an emerging topic.

Chapter 3: Research Context and Methodology

Overview

This chapter illustrates how the design of this mixed methods convergent parallel study aimed to fill in some of the research gaps discussed in Chapter 2 from a methodological perspective. First, the chapter starts with a general overview of the primary rationale behind the research and methodology. Supported by the detailed description of the study's participants and instruments, this chapter explains methods employed to answer research questions and an overview of data collection, analysis, integration, and management procedures. Concluding the chapter, I discuss the ethics of this study and present my stance as the researcher in this study.

3.1 Aims, rationale, research gap, and research questions

Having discussed theoretical underpinnings and previous research findings central to the focus of this dissertation, this mixed method convergent parallel study aims to determine a model of TE in OLEs to support SL. It also aims to build a comprehensive understanding of how families' roles have changed in supporting SL during times of crisis caused by the COVID-19 pandemic in Hungary, Kazakhstan, and Poland. Within these broad intentions, the specific research objectives for the study are:

- to examine how technological pedagogical and content knowledge skills (TPACK) of English as a Foreign Language (EFL) teachers in the 21st century support SL
- to explore how three presences in the Community of Inquiry (CoI) - cognitive presence, teaching presence, or social presence- promote SL remotely in K-12 EFL context
- to explain how the digital divide in Hungary, Kazakhstan, and Poland impacts families and children, and K-12 EFL education
- to take a reflexive and critical stance of educational technology, and prioritise pedagogy over technology, and
- to generate theoretical support to construct a framework of TE for K-12 EFL in OLEs based upon quantitative and qualitative evidence.

To these ends, I have formulated the following research questions of this study:

RQ1: What is foreign language schoolteachers' strong and weak TPACK21? (Technological Pedagogical and Content Knowledge)

RQ2: What is the relationship among social presence, teaching presence, and cognitive presence of the Community of Inquiry as reported by school students?

RQ3: What are school stakeholders' (secondary school foreign language teachers, students, parents, and educational technology experts) perceptions on the pedagogical use of educational technology associated with this remote, i.e., online instruction?

RQ4: How do school students, teachers, and families live through the shift in traditional boundaries in learning environments?

RQ5: What issues did teachers experience in switching to emergent remote teaching and learning?

Mixed methods question: To what extent, if any, did the combination of survey research, in-depth interviews and classroom observations provide a more comprehensive understanding of teachers' and families' roles in supporting students' learning and maximising teacher effectiveness in Hungary, Kazakhstan, and Poland?

It is evident that the theoretical and empirical literature review discussed in Chapter 2 identified the following research gaps from a methodological perspective:

1) It is scarce to find recent studies focusing on more than one profile of school stakeholders in research connected with teacher effectiveness and student learning in times of crisis. Limited research (e.g., Hajar & Manan, 2022a; Homoki & Nyitrai, 2022; Marchlik et al., 2021) had focused on one profile of participants, e.g., teachers or students or families lacking data triangulation and family practices in facilitating SL with EdTech in times of crisis such as the COVID-19 pandemic.
2) Second, the study employs mixed methods convergent parallel design incorporating quantitative and qualitative strands of data collection and analysis simultaneously with some time lapses (Teddlie & Tashakkori, 2009). By following this design, the study sought to contribute to the existing body of knowledge by shedding light on how teaching and learning happens in less familiar online learning environments during an emergency situation such as the COVID-19 pandemic. That is, this is the first study of a comparative nature, to the author's knowledge, that explored what can be learnt about the phenomena quantitatively and qualitatively via data integration and merged analysis techniques.
3) Third, to analyse to what extent digitalisation strengthened teacher effectiveness and supported student learning during school closures due to the COVID-19 pandemic at an individual's level. Specifically, to understand which certain technology integration language teaching and learning practices maximise TE and support SL in the researched contexts in relation to examined study participants.

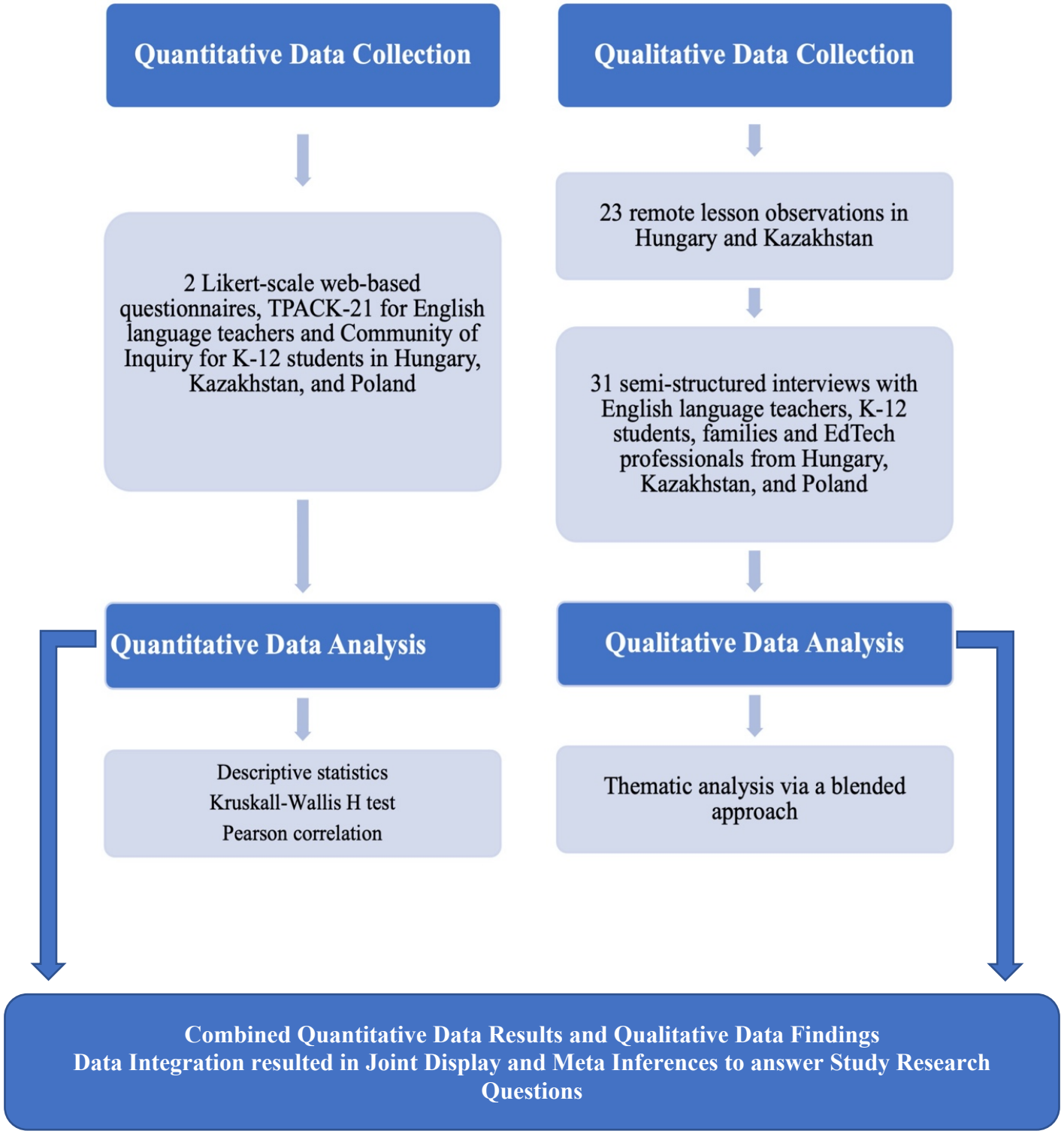
3.2 Research design and methods

The unique contexts of digitalisation of school education in Hungary, Kazakhstan, and Poland (see chapter 2, section 2.4) intersecting with empirical findings from the recent literature in technology-enabled language teaching and learning informed the design of this study. First, few previous studies had investigated TE in OLEs in contexts of an emergency situation such as the COVID-19 pandemic in Hungary, Kazakhstan, and Poland (see chapter 1 for details of evidence). Second, previous studies focusing on the role of parental involvement and support to SL during the crisis such as the recent global pandemic had focused on parental stress, family mental health (see chapters 1 and 2), and parents' perceptions about children's online learning during the COVID-19 (Zhang, 2021).

Given the potential significance of this study in relation to these areas mentioned above and to emergency situations forcing teaching and learning to primarily OLEs, a mixed methods design became the most appropriate research approach of the study phenomena. Specifically, mixed methods convergent parallel study design benefits a study methodologically, epistemologically, and theoretically adding clarity throughout all phases of the research cycle (Peters & Fàbregues, 2023). First is that both qualitative and quantitative strands of data collection and analysis are implemented independently throughout these processes (DeCuir-Gunby & Schultz, 2017). The essence of combining two strands of data and associated methods was to explore and understand the studied phenomena systematically in a complex environment (Miles & Huberman, 1994, p. 41) both at the level of specific data sets, design of the study, and the analysis to examine the research contexts. Thus, triangulating the research results (Miles & Huberman, 1994, p.41) gained from the quantitative and qualitative methods was an optimal choice for this research project to achieve a better understanding of the phenomena under study (See Figure 8 below for the visual representation of the study design).

Second is the simultaneous and independent qualitative and quantitative data collection and analysis offer opportunities to expand theories. As detailed below, both quantitative and

Figure 7 Research design of the study



qualitative data were gathered and analysed simultaneously with some time lapses (Teddlie & Tashakkori, 2009). That is, that some of the participants across contexts had the opportunity to express their views in quantitative and qualitative ways. The results and findings constructed during data analysis is carried out to infer about the inquiry problem (Peters & Fábregues, 2023) in an interactive and iterative manner. In this study, data integration and merge analysis were conducted in accordance with the mixed methods convergent parallel approach (Peters & Fàbregues, 2023) via joint display to learn about the phenomena qualitatively and quantitatively.

3.2.1 Methods of comparison and their relevance to the study research design

According to Steiner-Khamsi (2009), one of the pre-requisites for a valid comparison lies in establishing a specific dimension of commonality against which two or more contexts can be compared. Furthermore, according to Lauterbach and Mitter (1998), aiming at similarity and diversity between the chosen subjects establishes a categorical and thematic interrelationship. In this study, the comparison was done based on how teacher effectiveness in OLEs, as viewed in the selected theoretical references widely discussed in Section 2.2 of this dissertation, was maximised in studied contexts, i.e., in Hungary, Kazakhstan, and Poland. Followed by the interpretation of the roles of families played in providing support to student learning and continuing schooling amidst the global pandemic, the comparative nature of this study sought to explore and understand the educational phenomena. Importantly, the comparative research method is secondary to the research design of this dissertation.

Among the various units of analysis in a study, e.g., whole educational system, length of education, the main interest of this study has been in exploring how the studied educational phenomena differ in three different contexts. That is, the major entity being studied and analysed is language teaching and learning and parental involvement in supporting student learning in times of crisis involving educational technologies for learning. Therefore, this study uses both geographic units of analysis (Ragin, 2006) and comparing times approach (Sweeting, 2014).

Geographic units of analysis distinguishes between observational and explanatory meanings of analysis (Ragin, 2006). Observational meaning refers to units used in data collection and analysis, i.e., individuals and social interactions between teachers and students. Explanatory meaning refers to the unit that is used to account for the pattern of results obtained. That is, data analysis at which theoretical explanations may be couched will take a multilevel approach.

The research contexts possess some commonalities in education systems affected by the dominant socialist political system in the past. The commonalities include, to name a few, given environmental factors such as teacher career structure, workload, teachers' salary (Csizér, 2019; Wilson et al., 2013;Wisniewski & Zahorska, 2020), parents' expectations toward children's learning, and emphasis on teacher-centred approach. However, acknowledging that broader technological development and innovations in school education influenced the way teachers teach and students learn digitally calls for a historical analysis in this comparative education study.

Comparing Times approach (Sweeting, 2014) rooted in the historical analysis equips this study with advantages and disadvantages. The former includes contextual understanding of digital education policy evaluation and comparative insights of educational policy responses across researched contexts. This understanding in turn will assist in discussing participants' language teaching and learning experiences remotely during the times of crisis such as the COVID-19 pandemic. The latter refers to problems of sources and interpretation which might involve lack of sources or linguistic challenges in accessing official data and interpretation bias (p.182).

Regarding interpreting the evidence of this study, a comparative research approach in exploring teacher effectiveness and the impact of digital technologies on language teaching and student learning met the contextualisation needs of this study (Kelchtermans et al., 2018). Specifically, an interplay of four contextual factors (Braun et al., 2011)- situated, professional, material, and external contexts- guided country selection:

1) English was not a medium of instruction in public schools (Situated context)
2) Implementation of educational digitalisation policies in K-12 was enacted before the COVID-19 (Professional context)

3) Countries provided technology access for teaching and learning and professional training for schools and teachers to some extent before the pandemic (Material context)
4) There was some form of institutional support (e.g., from a school) via provision of laptops to teachers, ongoing training for remote education purposes during the pandemic, varying degree of flexibility in the curriculum from a government (External context)

To achieve this, I illustrated how contextual elements presented above were brought to the forefront in Section 2.4. In other words, to understand how digitalisation policies were translated from the policy text to the policy practice in school education for different school stakeholders. Second, to witness how educational policy responses were implemented at the outbreak of the COVID-19 pandemic and as it was developing, multilevel analyses of this study data will be presented in detail in Chapter 4.

Furthermore, to strengthen the multilevel analyses, this study exhibits the four-step Bereday's (1964) method of the comparative analytical component (Figure 9). The Bereday's method consists of:

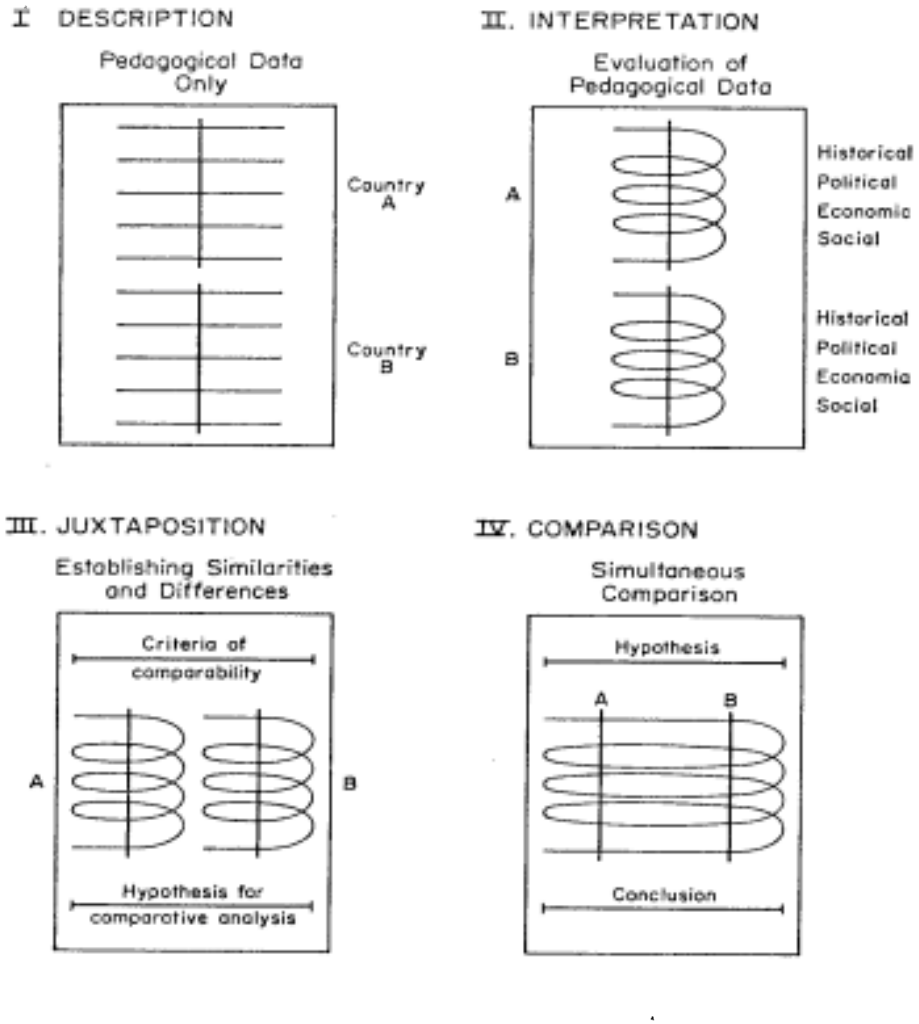
1) description of language teaching and learning data involving digital technologies from home during the pandemic, based upon the numeric, textual, and observational data collection,
2) interpretation of each unit of comparison in the framework of overall educational and also political, economic, and social conditions, with special regard to the historical factor,
3) juxtaposition, establishing similarities and differences based on the descriptive and interpretive results of the preceding inquiries, thus forming a hypothesis for comparison,
4) comparison of the whole inquiry simultaneously (Bereday, 1964).

The Bereday's four-step method fits the analytical approaches of this mixed-method convergent parallel study. The author followed the steps of this method in an iterative manner and multilevel nature of data analysis in this study. Additionally, the

comparative methods used for the purposes of this research played an important role in analysing and interpreting data at the level of mixed methods.

Figure 8 Bereday's Model for Undertaking Comparative Studies

Original Source: Bereday (1964, p.28)



3.2.2 Population, sample, and sampling

This study used a mixed purposeful multi-stage sampling strategy (Onwuegbuzie & Collins, 2007, p. 286, p.292; Teddlie & Tashakkori, 2009) in three research contexts. This multilevel sampling strategy helped prevent potential bias in participant recruitment and selection such as economic bias (Roztocki, 2001) or elite bias (Miles & Huberman, 1994, p. 41). Table 2 illustrates sampling strategies applied gradually in both quantitative and qualitative methods of data collection.

Table 2 Sampling scheme used in the convergent parallel mixed method study

Time Orientation: simultaneously

Quantitative components	Inclusion criteria
Purposive sampling	Participants of the study meet ALL selection criteria
Criterion sampling	Participants of the study meet ALL selection criteria
Convenience sampling	Participants of the study can be reached online and must have strong Internet connectivity for virtual data collection
Snowball sampling	Participants of the study recommend other participants whose profile meets almost all or all criteria of the study
Qualitative components	Inclusion criteria
Multistage purposeful maximum variation sampling	Participants of the study meet ALL selection criteria
Criterion sampling	Participants of the study meet ALL selection criteria
Convenience sampling	Participants of the study can be reached online and must have strong Internet connectivity for virtual data collection
Snowball sampling	Participants of the study recommend other participants whose profile meets almost all or all criteria of the study

The target population of the study had to meet the following criteria in all three contexts:

- All participants could provide information rich data (Patton, 1990, p.169),
- All participants owned or had access to strong Internet connection, strong Internet bandwidth for video and audio conference calls, and necessary devices to teach and study online during the pandemic,
- All participants could either communicate in Kazakh and/ or English and/ or Russian both in written and verbal forms according to CEFR

- None of the participants had any connection to private schooling before- and during-the pandemic, i.e., before March 2020 and from March 2020-the autumn 2021 in three research sites. The inclusion of the participants from public schools provided an important indicator as to how public school stakeholders lived through the challenges of ERE in three research sites
- English teachers who could reflect on their EFL teaching in public secondary schools pre-COVID-19 and who had to teach from home during the pandemic, i.e., during March 2020 to the autumn 2021,
- Local families who had to provide home-based learning to their children aged 10 to 18 because of the pandemic. It was important that families were citizens in a research context and lived in a research site. That is, the study excluded families whose parents were not receivers of the public-funded schooling; who lived abroad while remaining a citizen of either Hungary, Kazakhstan, or Poland; or who was in an international marriage and whose children attended a private school,
- K-12 students aged 10 to 18 who had to study from home during the pandemic, and
- Educational technology experts, who a) participated in the evolution of educational technologies responding to challenges in remote teaching and learning caused by the novel virus COVID-19; b) were in close contact pre- COVID-19 and during-COVID-19 with product development or provided professional development on the technology use for learning purposes to K-12 schools or technical equipment to schools.

To recruit K-12 students, I used a snowball sampling technique. A total of 343 teachers and 263 K-12 students across three countries accessed the questionnaires. However, the response rate varied, with only 29 % of teachers and 75% of students completing the entire questionnaire meeting the study's data requirements.

As the overall teacher sample size needed was insufficient, the qualitative data collection was performed in parallel attempting to arrive at answers to the research questions in this study. Table 4 presents teachers' demographic data.

K-12 students, aged 10 to 21, were predominantly between 13 and 18 years old, with the largest group being 16-year-olds (19.3%), followed by 17-year-olds (17.8%), and 18-year-olds (12.2%). A smaller proportion of the sample consisted of participants younger

than 13 (5.6%) and older than 19 (6.1%). Country distribution of the participants can be further found in Table 3.

Table 3 K-12 students' demographic data across three research context

Country

	N	%
Hungary	53	26.9%
Kazakhstan	72	36.5%
Poland	72	36.5%
Total	197	100%

For the remote lesson observational data purposes, I sought permission among English language teachers I have already interviewed or was going to. Urban-based secondary and high schools from Hungary and Kazakhstan granted the school principal's permission and their verbal agreement to observe remote English lessons hosted on Zoom and Google classroom platforms. Observed teachers informed their students of the virtual lesson observation by the researcher. Because of the various limitations during data collection in Poland during the pandemic I could not gain access to schools, English teachers, and their remote lessons. As a result, there was no data collected from Poland's remote EFL lessons.

To recruit families I have posted information on my personal social media accounts, advertised the call for participation through Alumni of Graduate School of Education, Nazarbayev University Facebook page (Kazakhstan), AIESEC in Poland network in LinkedIn, Expats moms and dads in Budapest (Hungary) group in Facebook. Following the essential criteria in recruiting EdTech experts, I used purposive criterion-based sampling strategy (Patton, 2002). Each educational technology expert I interviewed was explicitly involved in either EdTech tool development or its distribution to schools and students nationally or regionally. Furthermore, the participants have collaborated with schoolteachers to assist in using EdTech for teaching and learning purposes during the national lockdowns in selected countries. The final sample for the interviews was 31.

Table 4 Teachers' demographic data across three research contexts

Demographic Variable	Hungary	Kazakhstan	Poland
Education			
Bachelor's	5	24	1
MA	20	25	13
Ph.D	2	0	1
Other	3	4	1
Total	30	53	16
Teaching experience			
1-3 years	2	6	0
4-9 years	16	24	5
10-20 years	6	15	4
20+ years	6	6	7
Other (please specify)	0	2	
Total	30	53	16
Age group			
22-30	6	17	0
31-40	5	25	6
41-50	11	4	8
51-60	7	5	2
60+	1	0	0
Total	30	51	16
Type of school			
Primary	3	16	7
Secondary	17	21	2
High	6	11	5
Others (kindergarten)	4	5	2
Total	30	53	16

3.2.3 Quality assurance in sampling

The selection of participants and sites strictly followed these criteria in all three countries:

- All participants could provide information rich data (Patton, 1990, p.169),
- All participants owned or had access to strong Internet connection, strong Internet bandwidth for video and audio conference calls, and necessary devices to teach and study online during the pandemic,
- All participants could either communicate in Kazakh and/ or English and/ or Russian both in written and verbal forms according to the Common European Framework of Reference for Languages (CEFR)
- None of the participants had any connection to private schooling before- and during-the pandemic, i.e., before March 2020 and from March 2020-the autumn 2021 in three research sites. The inclusion of the participants from public schools provided an important indicator as to how public school stakeholders lived through the challenges of ERE in three research sites,
- English teachers who could reflect on their EFL teaching in public secondary schools pre-COVID-19 and who had to teach from home during the pandemic, i.e., during March 2020 to the autumn 2021,
- Local families who had to provide home-based learning to their children aged 10 to 18 because of the pandemic. It was important that families were citizens in a research cite and lived in a research site. That is, the study excluded families whose parents were not receivers of the public-funded schooling; who lived abroad while remaining a citizen of either Hungary, Kazakhstan, or Poland; or who was in an international marriage and whose children attended a private school,
- K-12 students aged 10 to 18 who had to study from home during the pandemic, and
- Educational technology experts, who a) participated in the evolution of educational technologies responding to challenges in remote teaching and learning caused by the novel virus COVID-19; b) were in close contact pre- COVID-19 and during-COVID-19 with product development or provided professional development on the technology use for learning purposes to K-12 schools or technical equipment to schools.

3.3 Quantitative instruments

The quantitative phase consisted of two self-reported questionnaires designed for EFL teachers and school students to report directly on participants' beliefs on technology use in EFL teaching and learning. The research questions 1 and 2 and theoretical underpinnings of the study guided the selection of these instruments. The questionnaires were designed to be mobile friendly and accessible directly from a Qualtrics website. The purpose of employing self-assessment questionnaires TPACK-21 and CoI was to describe the characteristics of a group at one point in time (Mertens, 2010). Another reason for choosing a self-assessment instrument was in its cost-efficiency and reliability. Self-assessment instruments have been found as important predictors of teachers' intentions to use technology (Scherer et al., 2017). Appendix C offers a full view of the instrument.

TPACK-21

To assess English language teachers' strong and weak technological pedagogical and content knowledge in accordance with some 21st century skills, the participants were asked to self-evaluate and indicate how confident they feel with respect to their TPACK – 21 (Valtonen et al., 2017). The 42 item- TPACK-21 (Valtonen et al., 2015) questionnaire consisted of two sections. First section included four demographic questions. Second section consisted of 38 items measuring EFL teachers' perceptions about using technology in a pedagogically meaningful way within a twenty-first century skills framework (Voogt & Roblin, 2012). TPACK-21 self-assessment questionnaire includes seven TPACK framework areas: pedagogical knowledge (PK; 7 items), content knowledge (CK; 4 items), technology knowledge (TK; 4 items), pedagogical content knowledge (PCK; 6 items), technological pedagogical knowledge (TPK; 6 items), technological content knowledge (TCK; 4 items) and technological pedagogical content knowledge (TPACK; 7 items). 21st-century skills, measured in the TPACK-21 questionnaire (Valtonen et al., 2015), refer to reflective thinking, problem solving, creative thinking, critical thinking, and ICT. Statements reflecting these skills can be found in PK, TPK, PCK, and TPACK items. For example, in the PK scale (Appendix C) questions relate to participants' self-assessment of their knowledge in supporting students' critical, reflective, and creative thinking, facilitating students' ability to make use of each other's thoughts, and supporting students'

problem-solving process. The TPACK-21 (Valtonen et al., 2015) questionnaire has provided short definitions of the 21st-century skills and scaffolding texts to guide the participants during taking the instrument. This questionnaire used a 6-point Likert-type scale on the seven domains within the TPACK-21 (1 = I need a lot of additional knowledge about the topic; 6 = I have strong knowledge about the topic). The CK component in this TPACK-21 questionnaire is content specific. Hence, the CK statements included EFL-relevant questions. For example, participants self-assessed their knowledge of the basic theories and concepts of languages or indicated their knowledge in developing contents in languages. Previous research has developed this instrument for (pre-service) EFL teachers' knowledge of the advantageous technology use in supporting 21st-century learning (Valtonen et al., 2017). As shown in Table 5, validation procedures have exhibited strong internal consistency reliability of the TPACK-21 instrument (Cronbach alpha coefficient) ranging from .88 to .96 for the seven TPACK subscales (Valtonen et al., 2017). According to George and Mallery (2003) this range is accepted to excellent. The authors (Valtonen et al., 2017) of the validated TPACK-21 instrument found an adequate reliability level for PK ($\alpha = .93$), CK ($\alpha = .92$), TK ($\alpha = .88$), PCK ($\alpha = .95$), TPK ($\alpha = .95$), TCK ($\alpha = .89$), TPACK ($\alpha = .96$).

Previously, TPACK instrument was validated in a number of past studies in the Hungarian, Kazakhstani, and Polish research projects (in Hungary- Fekete, 2022; in Kazakhstan- Joldanova et al., 2022, Orakova et al., 2024, Zhakiyanova et al., 2023; in Poland- Demeshkant et al. 2020, Soszyński, 2022; Tomczyk et al, 2023). However, TPACK-21 was not validated in either of the research contexts as per the author's knowledge.

Community of Inquiry

The Community of Inquiry (CoI) questionnaire (Garrison et al., 2000) was a self-assessment instrument designed for K-12 students in three research sites available for the participants at Qualtrics during the data collection phase. It consisted of 34 items (see Appendix D) and two demographic questions depicting participants' country of origin and age. The purpose of the CoI questionnaire was to assess K-12 students' perceived levels of social, cognitive and teaching presences with reference to their understanding of online

learning during the crises. The CoI questionnaire measured three types of presences, namely, teaching presence (TP), cognitive presence (CP), and social presence (SP). Each type of presence had sub-components. Table 6 shows distribution of the instrument questions. Previous research used the same scale, and the reliability and validity were found high in different contexts (Ma et al., 2017). In their study (Ma et al., 2017) Cronbach's α coefficient for TP was .0990, for SP the reliability and validity were 0.936 and 0.920, respectively, for CP reliability score was .0984.

Table 5 Internal consistency values for the TPACK-21 questionnaire

Original source: Valtonen et al., 2017

TPACK-21 domain	Internal consistency	Item Count	Item Example
Pedagogical Knowledge (PK)	.93	7	Guiding students' discussions during group work (2-5 students)
Content Knowledge (CK)	.92	4	I have sufficient knowledge in developing contents in English teaching
Technological Knowledge (TK)	.88	4	I can solve ICT related problems
Pedagogical Content Knowledge (PCK)	.95	6	In English teaching, I know how to guide students' critical thinking
Technological Pedagogical Knowledge (TPK)	.95	6	I know how to use ICT in teaching as a tool for students' reflective thinking
Technological Content Knowledge (TCK)	.89	4	I know websites with online materials for studying English language learning
Technological Pedagogical Content Knowledge (TPACK)	.96	7	In English language, I know how to use ICT as a tool for sharing ideas and thinking together

Table 6 Internal consistency values for the CoI questionnaire
Based on Ma et al., 2017

CoI domain	Internal consistency	Item count	Item Example
Teaching Presence (TP)	.1	13	The instructor clearly communicated important course topics
Social Presence (SP)	.9 4	9	Getting to know other course participants gave me a sense of belonging in the course
Cognitive Presence (CP)	.9 9	12	I can apply the knowledge created in this course to my work o other non-class related activities.

Administration of the questionnaires

As described in section 3.2.3, sampling procedures for two questionnaires was multilevel purposeful. To gather responses online from targeted population I created a mobile-friendly Qualtrics page in English to access anonymously via direct links in emails or as a shared link in social media groups. Since the TPACK-21 and CoI instruments were previously validated in Valtonen's et al. (2015) study and in Arbaugh et al. (2008) study, there was no need to translate them to English.

Although the questionnaires were anonymous, there were a few demographic questions collected from participants. These items were also used to filter who was matching the participant selection criteria and who agreed to participate in a follow-up interview.

3.4 Qualitative instruments

Semi-structured interviews

Teacher level data came from two qualitative data sources: from semi-structured interviews and remote lesson observations. The interview protocol was developed for other participants as well, i.e., families, K-12 students, and EdTech experts (see Appendix E). The protocol with these participants reflected theories and concepts framing this mixed methods convergent parallel study. The research sub-questions included questions reflecting FfT Domains I and II, the CoI questionnaire, the Digital Divide, the effects of the COVID-19 on teaching and learning. For example, the questions explored how a

teacher provided safety to their students in EFL teaching and learning during the pandemic. Another question looked at EFL teacher's knowledge of their students' backgrounds in the light of the pandemic and to what extent the teacher used that knowledge in planning and preparation for EFL lessons.

The interview protocol with families focused on this group of participants' experiences in using educational technologies in a student-oriented way in home-organised learning spaces. Some of the questions have specifically asked how families have adapted to new roles in terms of their involvement in children's learning. Some other questions asked if parents noticed how educational technologies met their children's language learning needs. In addition to the qualitative data of teacher perceptions of TE within the FfT, interviews with K-12 students in three research contexts reflected concepts of domains I and II. After interviews with some families, children joined the study based on their parents' recommendations to participate in the study.

The interview protocol with EdTech experts included questions about social, cognitive, and teaching presences built-in in educational technologies. Additionally, the questions focused on how educational technologies meet teachers' and K-12 students' teaching and learning needs. Furthermore, the questions inquired whether the EdTech industry in a specific research context was aware of the challenges that the school stakeholders (teachers, students, schools, and families) experienced during the ERE implementation.

Remote lesson observations

I have conducted 23 non-participant remote EFL lesson observations (Marshall & Rossman, 2011, p. 143) informed by the Danielson's Framework for Teaching (FfT) tool. FfT has proven to be a valid and reliable tool for classroom observations (see chapter 1) and subjected to inter-rater reliability tests (Elemendorf & Song, 2015; Schoenfeld et al., 2018). The observation form measured EFL teacher's pedagogical knowledge, content knowledge, and technology use as evaluated in Domain I, Planning and Preparation, and Domain II, The Classroom Environment. The form included an evaluation rubric of teacher performance in the designated domains and statements of teacher behaviour. Danielson's (2013) FfT was chosen because it has been reviewed, validated, and subjected to inter-rater

reliability tests. Additionally, it was increasingly used as the selected evaluation tool by state departments of education in the U.S. studies (Bill & Melinda Gates Foundation, 2010). Namely, the rubrics evaluated the teacher's performance as unsatisfactory, basic, satisfactory, and distinguished. Further, I chose classroom observations because my review of previous research on teaching and learning during the pandemic revealed a lack of studies using this method of data collection. The remote EFL lesson non-participant observation employing Danielson's FfT tool mirrored questions in online semi-structured teacher interviews. This was done in order to integrate interview data with observational data at the qualitative data analysis stage. Duration of remote lesson observations lasted from 45 minutes to 90 minutes with a five-minute break. Most of the lessons happened in the morning in the first few months of the national lockdown in Hungary and Kazakhstan (April and May 2020). The observation form is included in Appendix F. Table 7 below summarises the observed lessons and participants.

Table 7 Characteristics of remote lesson observations

Researched context	Total number of lessons observed	School type	Students' age	Teacher's age
Hungary	7	Urban secondary technical school	15-16	33
Kazakhstan	16	Urban secondary school with mixed languages of instruction	10-11 11-12	31 38

During observing remote language lessons, I was careful to minimise potential disruptions from my side. For instance, my participation was overt to school students, they knew who I was, and why I was there. In order not to desert the schoolteachers who permitted to observe their remote English lessons, I offered to review the interview texts and observation forms before the data analysis process. Some schoolteachers specifically asked to share feedback sheets based on observation forms used in the data collection process to consider whether they needed any improvements in their teaching language methodology in online settings.

Notably, the remote EFL lesson observations did not happen in Poland. I could not establish any connection with public schools and EFL teachers from the public schools to access their remote lessons during the pandemic. When I gained Polish teachers' trust and

established a strong connection with them for conducting semi-structured interviews, Poland had re-started in-person schooling.

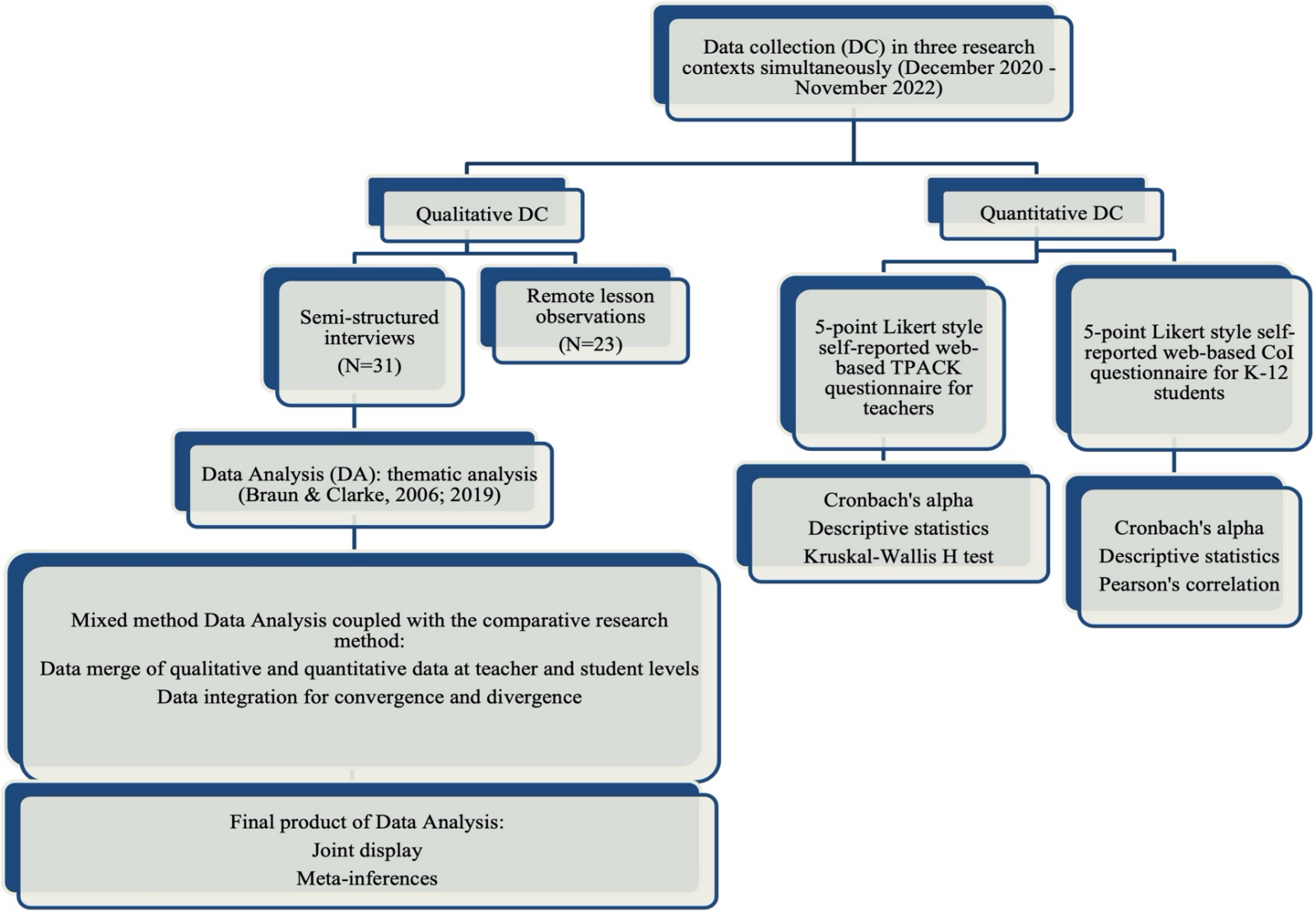
3.5 Data collection procedures

I gathered quantitative and qualitative data simultaneously and with some time lapse (Teddlie & Tashakkori, 2009) without giving any priority to either of them during the collection stage in three research contexts. More importantly, these phases of data collection addressed the same research questions (p. 129). Figure 10 depicts a procedural diagram (Miller & Bustamante, 2016) of data collection. Because of the time difference in gaining ethics permission from each of the research sites, data collection in Hungary started three months earlier in comparison to Kazakhstan and Poland. Also, because the K-12 teacher population was on strike in Hungary and it was challenging to find Polish participants for the quantitative strand, I had to continue quantitative data collection further in 2022. Despite the fact that data collection has been completed for Kazakhstan in 2021, I did not start the quantitative data analysis of this mixed methods convergent parallel study because I had few teacher responses from other sites.

Data collection plan followed the multi-stage purposeful recruitment strategy. Questionnaires were administered to participants online at www.qualtrics.com and distributed in social media and emails employing convenient and snowball sampling methods. To verify that all participants were representatives of the study population, a question enquiring if the participant can take a questionnaire in English, comes from one of the research contexts, and has taught or studied online during the pandemic in that context was asked. Only those who confirmed and met demographic characteristics such as age, initial teacher education, type of school (e.g., primary or secondary), years of teaching experience were included in the study.

Since data collection took place during national lockdowns in three research contexts, participants were recruited online using recruitment materials (see Appendix G) via the following social media sites: Facebook, Instagram, LinkedIn, e-mails, and Messenger. Specifically, I targeted

Figure 9 Procedural diagram



Note: Quantitative data collection started in Hungary in December 2020 after obtaining ethical permission. In Kazakhstan and Poland quantitative and qualitative data collection started in March 2021 after obtaining ethical permission.

English language groups and associations such as Mi, angoltanárok (We're English teachers) group (Hungary), Kazakhstani Teachers of English Association (KazTEA), National Centre of Teacher Professional Development Orleu (Kazakhstan), British Council local offices in Hungary, Kazakhstan, and Poland, International Association of Teaching English as a Foreign Language in Poland and in Hungary, Polacy & Polonia na Węgrzech.

The study target audience were clarified on the consent form at the beginning of taking the questionnaires and before conducting interviews and remote lesson observations. It was made clear that the entire data collection process will be anonymous and strictly confidential, and there is no harm in participating or withdrawing from the research in any of its stages.

I have conducted 31 semi-structured individual interviews with EFL teachers, families, K-12 students, and educational technology experts and 23 non-participant remote EFL lesson observations (Marshall & Rossman, 2011, p. 143) from January 2021 to October 2022 via Zoom and MS TEAMS. The interview participants were citizens of each of the research context who were familiar with local educational legislation, EFL curriculum requirements in secondary education, and who had to stay home to teach and study because of the national lockdown during the COVID-19. It was important that the participants had a strong internet connection to record and store audio interview files on the researcher's computer. In selecting participants for the interview purposes, I have relied on using multiple sampling strategies discussed above. However, it should be mentioned here that some of the teacher and K-12 student participants joined the interview after taking questionnaires of the study. Each interview lasted between 90 and 110 minutes and was audio recorded. Participation was invitational and voluntary.

3.6 Data analysis

In investigating how TE supported SL in OLEs and how emergency situations such as the COVID-19 pandemic affected the roles of families in supporting children to continue learning from home during national lockdowns, this study follows a multilevel analysis (Bray & Thomas,

1995). This analytical approach intends to illuminate local priorities and individual language teaching and student learning practices integrated with EdTech by the participants of this study. In other words, the analysis is iterative linking macro level national policy context for digital education in schools with meso level technology integration language teaching and learning practices, individual students, and families. Specifically, the analysis viewed how the attributes of remote education, associated with times of crisis such as the COVID-19 are juxtaposed in the featured countries, i.e., Hungary, Kazakhstan, and Poland. In other words, participants' experiences of organising and providing language teaching and student learning at the outbreak of - and during the COVID-19 pandemic in research contexts will be interpreted.

3.6.1 Data analysis quantitative strand

The quantitative data was analysed at the level of descriptive statistics and inferential statistical analyses. Both questionnaires were tested for internal consistency reliability showing a high score.

TPACK-21

The purpose of quantitative data analyses in this mixed method convergent parallel study was to determine strong and weak TPACK as reported by the participants in three research sites. To begin with, all variable names and the corresponding numerical values were transferred to an SPSS file. In this study I have used the SPSS statistical package version 29. Descriptive statistics was calculated to determine mean values of teachers' TPACK perceptions based on four variables: 1) country of origin, 2) age, 3) years of teaching experience, and 4) type of school participants were teaching in. Next, I identified the consistency of participants' responses across all of the TPACK-21 items. Cronbach's alpha was .928 which indicates high consistency across items and provides evidence for an underlying construct. Importantly, the instrument was designed and validated by the authors (Valtonen et al., 2015).

Of 343 recorded responses across the studied contexts, 100 responses were retained in the final sample and used in the data analysis. The email distribution list, available during data extraction at www.qualtrics.com, showed suspicious answers among questionnaire takers. Particularly, inconsistent responses, similar IP addresses, rapid pace of entries and the proportion

of questions left unanswered were flagged as suspicious or fraudulent. For example, I removed submissions if participants took fewer than ten minutes to complete the questionnaire or fewer than five minutes to complete the three quarters of the questionnaire. These cut-offs were based on the overall distribution of respondents' completion times. In the majority of removed cases the completion time was under three minutes for the three important portions of the questionnaire or less than sixty seconds in responding at all. Items that had missing data and were critical for the assessment were not deleted to prevent the violation of the content validity of the scale. After data clearance, non-parametric Kruskal-Wallis H test was performed. The purpose of the test was to determine whether there were differences in the distributions of TPACK scores between teachers that differed in their country of origin, years of teaching experience, educational degree, and type of school they worked at.

According to the results presented in Table 8, Poland illustrated the strongest TPACK-21 (M=4.41, SD=.280) and Kazakhstan showed the weakest TPACK-21 score (M=4.07, SD = .173) among teachers. Please note that complete agreement with the item was measured at a score of six. The reliability coefficient (Cronbach alpha) of TPACK-21 questionnaire was .96 showing high internal consistency between the items. Sample is described in tables 8-11 followed by descriptive statistics in tables 12-16.

Next, I ran a non-parametric Kruskal-Wallis H (Vergha & Delaney, 1998) test to examine whether there was a statistically significant difference between the strongest and the weakest TPACK score depending on teachers' age, educational level, years of experience, and their working place. According to the Kruskal-Wallis H test, there was no statistically significant difference between the groups based on the "YearsOld" variable, "Educational level" and "Teaching Experience" variable with respect to their TPACK-21 average scores at the significance level (p = .05). Groups based on the "TaughtPlace" variable with respect to their TPACK-21 average score showed a statistically significant difference at the significance level (p = .05). Tables 17-20 show Kruskal-Wallis H test results revealing insignificant differences (Asymp. Sig. = .714) in the preference to the level of teacher education, years of teaching experience (Asymp. Sig. = .392) and teachers' age (Asymp. Sig.= .058). Since Kruskal-Wallis test indicated significant differences based on the variable of "TaughtPlace" (see Table 16), I conducted post-hoc test to

determine which specific group differed from each other. Summarising, the only statistically significant difference was found between teachers from high school and others after applying the Bonferroni correction (Adj.Sig.=.46) highlighted in Table 21.

Table 8 Sample demographics per country and age group

	AgeGroup											
	21-30		31-40		41-50		51-60		60+		Total	
Country	N	%	N	%	N	%	N	%	N	%	N	%
Hungary	6	26.1%	6	16.2%	11	44.0%	7	50.0%	1	100.0%	31	31.0 %
Kazakhstan	17	73.9%	25	67.6%	6	24.0%	5	35.7%	0	0.0%	53	53.0 %
Poland	0	0.0%	6	16.2%	8	32.0%	2	14.3%	0	0.0%	16	16.0 %
Total	23	100.0%	37	100.0%	25	100.0%	14	100.0%	1	100.0%	100	100. 0%

Table 9 Sample demographics per country and teaching place

	Teaching Place											
	Kindergarten		Primary school		Secondary school		High School		Other		Total	
Country	N	%	N	%	N	%	N	%	N	%	N	%
Hungary	0	0 %	3	11.5%	17	42.5%	11	33.3%	4	40.0%	31	31.0%
Kazakhstan	1	100%	16	61.5%	21	52.5%	15	45.5%	4	40.0%	53	53.0%
Poland	0	0 %	7	26.9%	2	5.0%	7	21.2%	2	20.0%	16	16.0%
Total	1	100%	23	100.0%	40	100.0%	33	100.0%	10	100.0%	100	100.0%

Table 10 Sample demographics per country and teacher education level

	Teacher education level									
	Bachelor's		Master's in education		Ph.D. in education		Other		Total	
Country	N	%	N	%	N	%	N	%	N	%
Hungary	5	16.7%	20	34.5%	2	66.7%	4	44.4%	31	31.0%
Kazakhstan	24	80.0%	25	43.1%	0	0.0%	4	44.4%	53	53.0%
Poland	1	3.3%	13	22.4%	1	33.3%	1	11.1%	16	16.0%
Total	30	100.0%	58	100.0%	3	100.0%	9	100.0%	100	100.0%

Table 11 Sample demographics per country and experience in teaching (in years)

	Experience in teaching (in years)											
	1-3 years		4-9 years		10-20 years		20+ years		Other		Total	
Country	N	%	N	%	N	%	N	%	N	%	N	%
Hungary	3	33.3%	6	17.1%	6	24.0%	16	55.2%	0	0%	31	31.0%
Kazakhstan	6	66.7%	24	68.6%	15	60.0%	6	20.7%	2	100.0%	53	53.0%
Poland	0	0.0%	5	14.3%	4	16.0%	7	24.1%	0	0%	16	16.0%
Total	9	100.0%	35	100.0%	25	100.0%	29	100.0%	2	100.0%	100	100.0%

Table 12 Descriptive statistics of teachers taking TPACK-21 across three research contexts

Country	N	Mean	Std. Deviation	Std. Error

PK	1	28	4.50	.960	.181
	2	51	3.93	1.050	.147
	3	16	4.05	1.362	.341
	Total	95	4.12	1.100	.113
TK	1	29	4.16	1.306	.243
	2	48	4.43	1.130	.163
	3	16	4.41	1.474	.369
	Total	93	4.34	1.241	.129
CK	1	29	4.13	1.329	.247
	2	51	4.21	1.097	.154
	3	16	4.14	1.049	.262
	Total	96	4.17	1.153	.118
PCK	1	27	4.58	1.043	.201
	2	51	4.13	1.037	.145
	3	16	4.27	1.253	.313
	Total	94	4.28	1.084	.112
TPK	1	27	4.12	1.101	.212
	2	49	4.07	1.087	.155
	3	16	4.08	1.219	.305
	Total	92	4.09	1.102	.115
TCK	1	29	4.77	.952	.177
	2	49	4.27	1.151	.164
	3	16	4.73	1.047	.262
	Total	94	4.50	1.092	.113
TPACK	1	29	4.27	1.088	.202
	2	48	4.07	1.199	.173
	3	16	4.41	1.121	.280
	Total	93	4.19	1.148	.119

Note: 1= Hungary; 2= Kazakhstan; 3= Poland. The highest and the lowest scores in each construct are bolded.

Table 13 Descriptive statistics of teachers taking TPACK-21 based on age

Age (years old)	PK	TK	CK	PCK	TPK	TCK	TPACK
21-30	4.19	4.93	4.29	4.41	4.67	4.79	4.58
31-40	3.98	4.43	4.18	4.01	4.04	4.24	3.97
41-50	4.33	4.10	4.06	4.58	4.11	4.66	4.50
51-60	3.95	3.64	4.18	4.28	3.49	4.45	3.78
Total	4.11	4.35	4.18	4.29	4.11	4.51	4.22

Table 14 Descriptive statistics of teachers taking TPACK-21 based on educational level

Education	PK	TK	CK	PCK	TPK	TCK	TPACK
Bachelor's	3.78	4.47	4.05	4.16	4.16	4.31	4.16
Master's in education	4.21	4.34	4.21	4.33	4.09	4.66	4.26
Ph.D. in education	4.68	4.19	4.50	5.04	4.13	4.31	4.00
Other	4.27	4.06	4.19	4.15	4.13	4.31	4.27
Total	4.11	4.35	4.18	4.29	4.11	4.51	4.22

Table 15 Descriptive statistics of teachers taking TPACK-21 based on teaching experience (in years)

Teaching experience	PK	TK	CK	PCK	TPK	TCK	TPACK
1-3 years	4.25	4.72	4.13	4.21	4.71	4.78	4.61
4-9 years	3.98	4.77	4.31	4.17	4.38	4.55	4.34
10-20 years	4.11	4.19	4.00	4.16	3.90	4.29	3.97
20+ years	4.16	3.89	4.14	4.52	3.80	4.56	4.15
Other	5.07	4.75	4.88	5.00	5.00	5.13	5.07
Total	4.11	4.35	4.18	4.29	4.11	4.51	4.22

Table 16 Descriptive statistics of teachers taking TPACK-21 based on the type of school

Type of school	PK	TK	CK	PCK	TPK	TCK	TPACK

kindergarten	2.57	3.25	3.75	3.17	4.00	4.50	5.43
primary school	4.06	4.85	4.39	4.24	4.40	4.66	4.45
secondary school	3.96	3.99	3.91	4.01	3.84	4.39	4.00
high school	4.47	4.14	4.32	4.69	4.01	4.38	4.01
other	4.29	5.08	4.45	4.82	4.75	4.98	4.94
Total	4.11	4.35	4.18	4.29	4.11	4.51	4.22

Table 17 Kruskal-Wallis test results based on teachers' educational level

Ranks							
	EDU	N	Mean Rank	Kruskal-Wallis H	df	Asymp.Sig	p-value
TPACK	1	26	42.48	1.364	3	.714	.05
	2	56	48.07				
	3	3	47.50				
	4	8	54.00				
	Total	93					

Note: 1= Bachelor's in teacher education; 2=Master's in teacher education; 3=Ph.D. in education; 4= other

Table 18 Kruskal-Wallis test results based on teachers' age

Ranks							
	YearsOld	N	Mean Rank	Kruskal-Wallis H	df	Asymp.Sig	p-value
TPACK	1.00	21	53.14	9.116	4	.058	.05
	2.00	33	40.71				
	3.00	24	55.52				
	4.00	14	35.75				

5.00	1	78.50
Total	93	

Note: 1=21-30 years old; 2= 31-40 years old; 3= 41-50 years old; 4= 51-60 years old; 5= 60+ years old

Table 19 Kruskal-Wallis test results based on teachers' teaching experience

Ranks							
				Kruskal-Wallis H	df	Asymp.Sig	p-value
	TCHNGEXP	N	Mean Rank				
TPACK	1	7	51.57	4.107	4	.392	.05
	2	31	49.63				
	3	25	39.32				
	4	28	48.13				
	5	2	70.50				
	Total	93					

Note: 1=1-3 years of experience; 2= 4-9 years of experience; 3= 10-20 years of experience; 4= 20+ years of experience; 5= other

Table 20 Kruskal-Wallis test results based on teachers' type of school

Ranks							
	TaughtPlace	N	Mean Rank	Kruskal-Wallis H	df	Asymp.Sig	p-value
TPACK	1.00	1	85.50	10.953	4	.027	.05
	2.00	22	49.59				
	3.00	39	43.65				
	4.00	21	38.67				
	5.00	10	68.00				
	Total	93					

Note: 1= kindergarten; 2= primary school; 3= secondary school; 4= high school; 5= other

Table 21 Pairwise Comparisons based on "TaughtPlace" variable

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
4.00-3.00	4.987	7.285	.685	.494	1.000
4.00-2.00	10.924	8.211	1.330	.183	1.000
4.00-5.00	**-29.333**	**10.341**	**-2.837**	**.005**	**.046**
4.00-1.00	46.833	27.549	1.700	.089	.891
3.00-2.00	5.937	7.177	.827	.408	1.000
3.00-5.00	-24.346	9.540	-2.552	.011	.107
3.00-1.00	41.846	27.258	1.535	.125	1.000
2.00-5.00	-18.409	10.265	-1.793	.073	.729
2.00-1.00	35.909	27.520	1.305	.192	1.000
5.00-1.00	17.500	28.229	.620	.535	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Community of the Inquiry

The purpose of the CoI self-reported questionnaire was to estimate the relationship among social presence, teaching presence, and cognitive presence of the Community of Inquiry. The instrument takers were secondary school students from the researched contexts who were from 10 to 18 years old at the time they studied from home during the COVID-19 pandemic. Most importantly, the participants possessed at least B2 English (CEFR[5]) to be able to respond to questions.

[5] CEFR= Common European Framework of Reference for Languages is an international standard for describing language ability (Council of Europe, 2001).

The CoI questionnaire data were analysed in two steps. First, scores of three presences were calculated based on participants' country of origin and their age. Cronbach's Alpha value of the instrument was estimated at .941. Second, Pearson correlation was conducted to measure the relationship between the three presences across case studies. Similarly to the TPACK test takers, there were data problems with the CoI questionnaire recorded responses (Kennedy et al., 2016). Only 197 responses were identified as valid responses, i.e., they were not duplicate and met the study's specific context, out of 263 questionnaire takers. For example, some responses indicated a higher age range than the baseline or some participants joined the study from non-researched contexts. Finally, after removing 38 records as outliers in the CoI data, 159 responses were analysed using Pearson correlation method. Descriptive statistics of school students is presented below in Table 22. The results, using Cronbach alpha, revealed the reliability of each sub-construct came in the range .542 to .879, with the reliability for each construct being .802- .923, and the reliability for CoI framework determined at .941 (see Table 23).

Table 22 Descriptive Statistics for the Community of Inquiry Measures Table

Items	Age, years	N	M	Std. Error
TP	10-15	66	3.6399	.08482
	16-20	126	3.9280	.05917
SP	10-15	66	3.5286	.07125
	16-20	126	3.5875	.05925
CP	10-15	66	3.4865	.07478
	16-20	119	3.7367	.55849
Total		192		

Note: TP= Teaching Presence; SP= social presence; CP= cognitive presence

Table 23 Internal coefficient of the Community of Inquiry instrument

Dimension	No of items	Cronbach Alpha	Constructs	Sub-constructs	No of items	Cronbach Alpha
CoI framework	34	.941	Teaching presence	Design and Organisation	4	.818
				Facilitation	6	.879
				Direct Instruction	3	.730
			Teaching presence		**13**	**.923**
			Social presence	Affective Expression	3	.573
				Open Communication	3	.651
				Group Cohesion	3	.542
			Social presence		**9**	**.802**
			Cognitive presence	Triggering Event	3	.787
				Exploration	3	.661
				Integration	3	.694
				Resolution	3	.662
			Cognitive presence		**12**	**.889**

To assess the relationship between TP, SP, and CP in school students from Hungary, Kazakhstan, and Poland aged 10 to 20, I conducted Pearson's correlation. Having removed the outliers, the CoI data met the assumptions to assess the relationship between CoI elements among

159 participants. There was a weak correlation (Cohen, 1988) between social presence and teaching presence among school students aged 10 to 18 in three countries, r=.27. Cognitive presence showed stronger correlation with teaching presence, r= .56 and with social presence, r= .053. In other words, there was no statistically significant correlation between social presence and teaching presence, r=.27, p= 0.01. The correlation between cognitive presence and teaching presence as well as between cognitive presence and social presence suggests a moderate positive linear relationship. This indicates that as cognitive presence increases, teaching presence as well as social presence tend to increase. Therefore, it can be implied that the relationship between cognitive presence and teaching presence, and cognitive presence and social presence is more substantial in comparison to social presence and teaching presence among school students aged 10 to 18 in three countries. This correlation is statistically significant at p=.01 level and it can be implied that this relationship is unlikely to be a result of random variation.

Table 24 Pearson's Correlation Table for the Student Sample Across Countries

	1	2	3
1. Teaching Presence	1		
2. Social Presence	.275**	1	
3. Cognitive Presence	.561**	.526**	1
N	159	159	159

** p < .01

3.6.2 Data analysis qualitative strand

To analyse qualitative data I used a blended approach of using a priori codes and inductively from interview and observational data. I analysed interview data using first and second cycle of coding (Saldaña, 2016) followed by a thematic analysis method (Braun & Clarke, 2006). During reviewing the literature, I have developed a codebook (Burns, 2021; DeCuir-Gunby et al., 2011) of the measured constructs measured in the quantitative and qualitative instruments detailed in Appendix H. As I was familiarising myself with interview data during the first cycle of coding by multiple re-readings of interview transcripts, I developed new codes via an inductive approach.

Thus, I have used the codebook blending deductive and inductive approaches to analysing and interpreting study data.

The first cycle of initial coding (Saldaña, 2016) generated 1510 codes via attribute coding, holistic coding, and structural coding techniques with the help of CAQDAS, MAXQDA (Release 22.8.0) (Verbi Software, 2022). In the second step I have reread the data and focused on the codes. Then I kept on re-reading interview data and codes to develop themes using multiple coding strategies such as concept coding, evaluation coding, and magnetic coding (ibid).

Next, I themed the data (Saldaña, 2016) to arrive to metasummaries (Sandelowski et al., 2007). The constructed themes summarised a major idea as evident in participants' interviews in individual cases and formed broader concepts for consideration. Identifying common themes across cases involved expanding, collapsing, merging, and creating categories that best and appropriate represented positioned and situated participants' stories of their experiences (Braun & Clarke, 2019).

To ensure credibility of the findings I triangulated different sources of information such as textual and observational data, all participants' demographic information across research contexts. I also carried out member checking after completing interviews with participants and aimed towards developing thick and rich case descriptions (Miles & Huberman, 1994).

Remote lesson observations.

To analyse remote lesson observations, I collected lesson observation notes taken in real time during remote lessons observed with Hungarian and Kazakhstani English teachers. I also took reflective notes following the observation of the lesson. The analysis of the textual data stemmed from remote lesson observations followed naturalistic research (Armstrong, 2010). In the case with the Hungarian teacher-participant, I reviewed collected qualitative data from the interview and the remote lesson with one specific teacher. In the case with the Kazakhstani teacher-participants, I reviewed collected qualitative data from different participants. The purpose of data review was to identify repeated patterns in the gathered textual data to further explain the interpretations. Next step was to explore how the findings of this study corroborate or conflict with the reviewed literature and FfT (Danielson, 2013).

To increase the validity of the research findings, I have used triangulation of data methods, data sources, and data participants (Miles & Huberman, 1994). Being the most reliable strategy in achieving the validity in qualitative studies, triangulation was achieved through data comparison and integration at the final stage of mixed methods data analysis.

To achieve the required trustworthiness and rigour in the qualitative paradigm of this research, I followed what Golafshani (2003) noted, "...the credibility of a qualitative research depends on the ability and effort of the researcher" (p. 600).

I implemented the following measures:

- researcher's involvement and immersion into the research including record of changes occurring throughout the research
- selected relevant research design to respond to the research questions
- theoretical triangulation and building interview protocols in connection to research questions, theories and concepts framing the study
- followed precise description of the research methodology and study techniques
- collected data according to the design of the study including adherence to the rules of interviewing, lack of suggestions, accommodating the interview participants' preferences for the time of interview, online location, and emotional distance
- aiming for the thick and rich qualitative data
- protecting the anonymity and confidentiality of the participants to safeguard the freedom of interviews
- rigorous selection of interview participants who were well-informed, met participants' criteria, and were willing to share their experiences related to the research questions
- triangulation of data sources including member checking, reflection on participants' feedback including their language and emotions
- use of the codebook developed during the review of the literature and as data analysis progressed
- high concern for accurate data analysis, especially in the context of coding and development of themes

- ethical use of otter.ai AI tool and Microsoft Transcribe Service in generating interview transcripts followed by a human detailed check
- comparison and researcher reflection sessions throughout the whole research process, and
- constant formative check of reliability

3.6.3 Mixed methods data analysis

Merged analysis of teacher-level data

To achieve the aims of this study and contribute added value and synergy of quantitative and qualitative data in mixed methods research, the analytical process followed data-driven inference (Younas et al., 2023) drawn from the study findings. The qualitative inferences of this study were repetitive in nature, explanatory, producing at times abstract themes about the investigated phenomena under consideration. The quantitative analysis, on the other hand, was based on the questionnaire data, on the extent and depth of analytical and inferential reasoning, not relying on the researcher's background knowledge about the research topic.

Given equal weight of the quantitative and qualitative data in this study design, I followed a three-step analytical process in this stage of data analysis. First, I collated key findings from separate data strands under broad concepts from the questionnaire results and the qualitative analysis themes. Namely, I considered the TPACK-21 results and CoI results guided by the research questions 1 and 2 of this study, and the qualitative themes guided by the research questions 3, 4, and 5. Second, I validated key questionnaire results from both teacher-level and student-level datasets, i.e., from TPACK-21 and CoI questionnaires, against the inferences based on the qualitative raw dataset. In other words, in this convergent parallel mixed methods study qualitative inferences about teacher effectiveness in online learning environments focused on the linkages between the themes and the questionnaire results. Third, to compare available data results for their congruence or divergence (Fetters, 2020), I juxtaposed the key findings from two data strands, following a comparative nature of this study discussed in section 3.2.1. The interpretations arrived at were guided by the theoretical framework and a blended approach of inductive and deductive analysis employed in this study.

Integrative phase analysis

To address the aim of the study, I decided to present findings for all three researched contexts holistically in a single joint display. Fetters et al. (2013) define a single joint display as a way to 'integrate the data by bringing the data together through a visual means to draw out new insights beyond the information gained from the separate quantitative and qualitative results'. Following this methodological advice, I started building the joint display by reexamining the theoretical framework of this study to achieve the overall aim. That is, I evaluated the theoretical propositions of the study through the lens of results achieved in this doctoral study.

I combined distinct results of the study triangulated in the first stage of mixed methods analysis (see section 4.7 later) to build a visual joint display. The visual joint display interprets investigated phenomena of TE in OLEs supporting SL adding more depth and insights that would not have been revealed otherwise (Bustamante, 2019; Peters & Fàbregues, 2023). The visual joint display integrates the main findings of this study examining common constructs from independently collected and analysed quantitative and qualitative data through expanding (Guetterman et al., 2021; Fetters, 2020; Fetters & Tajima, 2022). Expanding strategy employed in the visual display connects overlapping theories studying teaching and learning in OLEs in one visual and articulates the meta-inferences that have resulted in this integration. The point of interface (Morse & Niehaus, 2009) occurred at the stage of drawing conclusions (Teddlie & Tashakkori, 2009). In building the joint display to present mixed methods findings for teachers, I developed histograms from the quantitative data across research contexts based on teachers' types of schools as variables that illustrated a significant difference. Then I selected qualitative data illustrating participants' interview responses based on their quotes (see Appendix I). This decision allowed me to analyse data supporting or conflicting each other presented as a meta-inference (Guetterman et al., 2021). Appendices J and K provide examples of this meta-inference as a teacher-oriented level and student-oriented level.

3.7 Data Management

To protect the anonymity and confidentiality of the participants of the study I used the following actions throughout the whole research process and especially in data analysis:

- developed a codebook during the literature review and regularly updated it to employ it during the data analysis,
- store all collected data- participants' questionnaire responses, audio interview recordings, interview transcripts and remote classroom observation forms, and researchers' reflexive journal- in e-copy and hard copy in a personal password-secured laptop, and
- all audio recordings will be destroyed after 5 years upon the completion of research.

3.8 Ethical Considerations

According to Hesse-Biber (2010) researchers need to address ethical implications of their research and be mindful of the moral integrity of their study in the entire research process (pp.55-59). Several strategies guided this study from the beginning. Before embarking upon the study, the researcher considered potential ethical issues that could have affected the conduct of the study. Specifically, the design of the study, the sampling procedures, the range of privacy concerns of publicly available data on social networking sites of potential research participants and deciding how the research would benefit the diverse profiles of research participants. Then, the study underwent the Institutional Research Ethics Committee review (Approval numbers are 2019/121 and 2020/471) with specific description of the research and appropriate informed consent form for research participants, interview protocols, and recruiting advertisements for each profile of research participants. Permission from the participating children under 18 was also sought by collecting parent's or guardian's, and child's signatures (see Appendix L).

The data collection for this study was carried out online by the author of this dissertation at the outbreak of the COVID-19 pandemic (December 2020- 2022) and in three different countries whose researching culture differed from one another. First, the author received permission to carry out the study granted by the ELTE Institutional Research Ethics Committee in Hungary in December 2020; the permission was re-issued in September 2022 to finish the data collection. Second, as the study was conducted outside Hungary, the researcher had to comply with research regulations specified by the ELTE Institutional Research Ethics Committee and apply for ethical permission from Kazakhstan and Poland. As a result, waiting time and seeking for gatekeepers in these respective countries delayed data collection in Kazakhstan and Poland. When the author

received ethical permission from all countries, the author followed their research regulations and conventions.

The qualitative component of this mixed method convergent parallel study required greater sensitivity to the participants' feelings because the nature of this study involved highly personal information. As there were no guarantees that recalling memories from quarantine periods may not cause the anxiety or any other unpleasant psychological conditions for the participants, I was aware of behaving in an ethically appropriate manner and accommodating the interview partner whenever possible. For instance, I did not push an interviewee for new information when the participant demonstrated discomfort during the interview. Likewise, I provided full freedom to children to deny responding, even in a case when a parent consented.

Additional ethical considerations were considered at the analytical stage of the study. Participants' identities remained private and no information that could potentially disclose their identity, specific location, or occupation was revealed. The researcher deliberately paraphrased information in the findings of the qualitative data that may have inadvertently identified participants. Thus, it can be argued that the study participants and their responses remain anonymous throughout the research.

The final ethical issues of this study included publication steps. Participants received a copy of the published article (Csonka-Stambekova, 2021). The material collected for this study and published in the Csonka-Stambekova (2021; 2023) study was collected and stored in accordance with the permission gained from the ELTE Research Ethics Committee on my private password secured computer. The study did not receive any external funding and any conflicts of interest were avoided prior to publication as expressed in the final publication. The data that support the findings of this study are available from the author upon reasonable request.

3.9 Reflexivity Statement

It is advisable to practice reflexivity to be aware how researcher's biases, values, personal background such as gender, history, culture, and SES influence their interpretations developed over the course of the study (Creswell, 2014, p.186). While it is not reasonable to eliminate researcher bias in the findings (Colorafi & Evans, 2016), it is important to consider and understand that researcher's expectations may affect the results of the study (Maxwell, 2013).

As a former remote English teacher from Kazakhstan, I was familiar with English language instruction in public schools with Kazakh and Russian medium of instruction. As an educational scholar, I was a proponent of constructivist instructional strategies and the framework of backward design in lesson planning. In other words, I desired to see and was curious to explore how these instructional design strategies could be used by a larger teacher talent. With the sudden hit of COVID-19 and rapid switch to remote teaching and learning I found how school stakeholders were confused about the teaching and learning. Specifically, how the learning needed to be organised and how technologically eadvanced the teaching was expected to become.

I practised a growth mindset (Dweck, 2007) and desired that more English language teachers from public schools could see the opportunity in forced teaching from home using educational technologies. I was keen to support teachers in growing professionally and becoming more effective by upgrading their digital pedagogy skills. That is why I familiarised myself with FfT, TPACK, and CoI to further frame the study with.

I was sympathetic to families and school students who struggled with adjusting to remote learning and staying at home because of the pandemic. Through their personal stories I have learnt how the pandemic revealed large societal issues of the Digital Divide. I was motivated to explore this complex phenomenon of how SL could be supported in challenging times worldwide.

The role of the researcher in this mixed method convergent parallel study was more of an objective patient observer and note taker. Although my previous experiences of teaching remotely via web conferencing included using advanced educational technologies in SL and assessment, I kept a separate reflection diary to reflect about the study. It has been found to increase the validity of the results (Qutoshi, 2018; Ravitch & Riggan, 2016). Additionally, I used member checking to reduce researcher bias (Maxwell, 2013).

I have paid specific attention to power issues in the entire research process (Leavy, 2017, p.184). When I was recruiting participants, I was concerned if an apparent power play between the researcher and the researched (Dreyer, 1998) would influence the data collection in any way. Hence, I was balancing between the tone of the initial conversation while ethically communicating the purpose of the study.

As an author of this research, I was aware and kept reminding myself that not all the circumstances involved in home-based education during the pandemic in the research sites have been considered. Some of them may not have appeared because the participants have not mentioned them. Some other details might have been said out of the record, and thus, have not been included into a final analysis and write-up. This does not mean that missing statements from the participants are marginal or not important. The dissertation text only mentions these experiences and challenges that the interlocutor regarded as significant enough to be disclosed and met the needs of the research. At the same time the current presentation of results does not mean that everything related to the TE and SL during remote education, such as ERE, has been discovered during this doctoral study. The results of this study introduce a challenge to some extent to policy makers in terms of the supply of the necessary equipment for remote education and training the school staff to carry out a/synchronous pedagogically valued education, especially in times of future crises. Families also need support and training to ensure they can provide adequate emotional, social, and educational assistance to their children in times of potential future crises.

3.10 Conclusion

Chapter 3 reported about the methods that were used to carry out this mixed method convergent parallel study in Hungary, Kazakhstan, and Poland. The purpose of the study, research questions, research design, population and sample, data collection, analysis and management were presented from both quantitative and qualitative approaches. The ethical considerations reflected the methodological issues the researcher faced while using the mixed methods convergent parallel design in this study.

The study explored the roles of families and school language teachers in supporting student language learning during the pandemic COVID-19 in Hungary, Kazakhstan, and Poland. The study also investigated teacher effectiveness and the relationship between strong and weak TPACK of the studied samples. To arrive at answers to the first two research questions, 88 English teachers and 193 school students from three research sites responded to the Likert-style TPACK and CoI questionnaires respectively. To empower participants through voicing their ERE experiences, I conducted 31 semi-structured individual interviews with EFL teachers, families, K-12 students, and educational technology experts, and observed as a non-participant 23 remote English lessons

in Kazakhstan and Hungary. According to the design of this study, the quantitative and qualitative results were collected simultaneously, analysed separately following comparative research methods, merged and integrated to achieve the aims of this study. To answer the mixed methods research question, the results of the qualitative and quantitative data analysis were compared and contrasted.

Chapter 4 Findings

This chapter presents findings of the study organised by the research questions. The chapter restates the aims of the study, research questions guiding the study, and presents results from the quantitative strand of analysis and findings from the qualitative strand of analysis. Followed by highlighting the similarities and differences between the results after data merging, the chapter provides further evidence to achieve the purpose of this study, i.e., theory refinement. The chapter then proceeds with the presentation of data integration in domains of pedagogy, content, and technology guided by the research questions. The chapter ends with the summary of findings.

4.1 Quantitative Results

RQ1: What are foreign language schoolteachers' strong and weak TPACK-21? (Technological Pedagogical and Content Knowledge)

In this part of my dissertation, I present quantitative results. The research aims for this quantitatively-oriented study was to (a) determine English school teachers' strong and weak TPACK-21, and (b) the relationship between three presences- teaching presence, cognitive presence, and social presence- in the Community of Inquiry framework.

The study assessed TPACK-21 and other related constructs among a total of 88 teachers from three countries: Hungary, Kazakhstan, and Poland in a 6-Likert style questionnaire. Seven key constructs were measured, including Pedagogical Knowledge (PK), Content Knowledge (CK), Technological Knowledge (TK), Pedagogical Content Knowledge (PCK), Technological Pedagogical Knowledge (TPK), Technological Content Knowledge (TCK), and Technological Pedagogical and Content Knowledge (TPACK).

Median TPACK scores were statistically significantly different based on the type of school (Asymp. Sig. = .027 respectively). Statistical significance was accepted at the p=.05 level. In relation to teachers' type of school they worked at, pairwise comparisons were performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons. This post hoc analysis revealed statistically significant differences in median TPACK scores between secondary schools (M=3.97) and other types of institutions (M=3.68), $\chi 2(4) = 10.953$, $p = .027$, but not between other group combinations. Appendix M contains a detailed report on distributions with a post hoc test.

According to the teachers' responses, it is evident that TPACK-21 scores varied between countries. Poland displayed the strongest TPACK-21 score (M=4.41, SD=.280) and Kazakhstan showed the weakest TPACK-21 score (M=4.08, SD = .179) among teachers. However, there were only sixteen participants from Poland. In Hungary and Poland, TCK was the strongest while in Kazakhstan it was TK. The weakest scale in TPACK in Hungary was TPK while in Kazakhstan and Poland these were PK and TPK. Furthermore, non-parametric Kruskal-Wallis H test indicated significant differences between types of schools. These results revealed important findings illustrating the relationship between this indicator and teachers' TPACK-21 scores. Specifically, Kruskal-Wallis H test results suggest that median value of TPACK-21 scores were significantly different for teachers working in different types of schools. This implies that teachers' school context may have an impact on their overall TPACK-21 score as to whether they teach in a primary or secondary or other types of schools. Tables 12 to 16 summarise the characteristics of TPACK-21 scales across case studies according to teachers' age and types of schools they teach in. Detailed presentations of TPACK-21 results questionnaire are available in Appendix M.

RQ2: What is the relationship among social presence, teaching presence, and cognitive presence of the Community of Inquiry as reported by school students?

192 school students from Hungary, Kazakhstan, and Poland took the CoI questionnaire showing non-normality in data distribution. The results provide valuable insights into the relationships between three types of presences among K-12 students across studies aged 10 to 18. While no statistical correlation was found between SP and TP, both CP and the associations between TP and SP were significant. These results suggest that to enhance both TP and SP in OLEs for learners aged 10-18 CP might be instrumental. However, further research is needed to explore the relationships between elements in each presence and the implications of these relationships in greater detail.

4.2 Qualitative Findings

The following qualitative findings are based on the qualitative iterative data analysis collected from semi-structured interviews with the participants and remote lesson observational data. I present major findings from qualitatively-oriented studies guided by research questions as a result of thematic analysis. I organise key rich findings by themes (see Table 25 or 26). After

that, I discuss similarities and differences between individuals at the level of their demographic characteristics as units of analysis and teachers' instructions observed in remote lessons in Hungary and Kazakhstan (See Section 4.6). Establishing similarities and differences in Domains I and II of the FfT Pedagogy and Planning and The Classroom Environment respectively (Danielson, 2013) allowed comparison of qualitative findings and quantitative results among teacher-participants.

RQ3: What are school stakeholders' (secondary school foreign language teachers, students, parents, and educational technology experts) perceptions on the pedagogical use of educational technology associated with this remote, i.e., online instruction?

The analysis of each research context yielded five overarching similar themes related to the participants' perceptions and experiences on TI practices and use of EdTech for language teaching and learning while implementing home-based emergent remote education in Hungary, Kazakhstan, and Poland. These themes were constructed during comparative analysis stemming from the findings generated during thematic analysis linked to the research questions 3, 4, and 5. Despite being common for all participants, a different number of categories and sub-categories comprised them that allowed a discussion of differences between the research contexts (see section 4.6.2). Overall, there were more similarities in participants' responses, in their views, and experiences of continuing teaching and learning in times of crisis in Hungary, Kazakhstan, and Poland.

The qualitative analysis yielded the following themes: (1) contributing factors of EdTech in teaching and learning, (2) limitations of EdTech in teaching and learning, (3) emotional roller-coaster, (4) changing roles of families, and (5) types of teachers' challenges in. Table 25 graphically summarises the first two themes generated in exploring research question 3.

Participants in this mixed-method convergent parallel study discussed a range of perspectives they held about the pedagogical value of EdTech for online learning. I identified key perspectives from the qualitative data, framing them into two overarching themes: (a) contributing factors of EdTech in teaching and learning, and (b) limitations of EdTech in teaching and learning.

Table 25 Conceptually Clustered Matrix: Pedagogical Value of EdTech as discovered in semi-structured interviews with participants across case studies

What are school stakeholders' (secondary school foreign language teachers, students, parents, and educational technology experts) perceptions on the pedagogical use of educational technology associated with remote, i.e., online teaching and learning			
Contributing factors of EdTech in teaching and learning as seen by			
Language teachers	**Families**	**Students**	**EdTech experts**
Content	Facilitation of student autonomy Environmental conditions for online learning	Environmental conditions for online learning	New quality of teaching and learning
Pedagogy			Student engagement
Knowledge of students and resources			Collaborative learning
Inclusive education			
Online classroom environment			
Limitations of EdTech as seen by:			
Language Teachers	Families	EdTech experts	
Lack of the pedagogical support for various language methodologies	Governance by the Big Tech	Missing social interactions	

Note: _____ = claim made strongly by more than one participant in more than one study

Importantly, I followed the theoretical framework of this study to observe the analysed data. Namely, Domain I and II of the FfT (Danielson, 2013), the TPACK (Mishra & Koehler, 2006) constructs- PK, CK, TK, PCK, TPK, TCK, and TPACK, the CoI (Garrison et al., 2000) components- TP, CP, and SP, and three levels of the Digital Divide (van Dijk, 2000). The use of the theoretical framework was essential as an analytic tool to facilitate the later merge of the quantitative and qualitative findings.

To enhance clarity, I present the findings from language teachers first, followed by families and students, and concluded by the EdTech experts. To respect the perspectives of each country, I strived to balance presenting findings from participants' interviews equally when it was possible.

For a thematic coding map of school stakeholders' perceptions about the pedagogical value of EdTech in teaching and learning see Figure 11 depicting findings of research question 3 below.

Theme 1: Contributing factors of EdTech in teaching and learning

Contributing factors of EdTech in teaching and learning addresses the participants' perceptions of this mixed-methods convergent parallel study to describe the pedagogical value of educational technologies for teaching and learning. Participants' perceptions, i.e., language teachers', families', K-12 students', and EdTech experts' were explored based on their experiences with educational technologies used in remote teaching and learning during the national lockdown caused by the COVID-19 pandemic in Hungary, Kazakhstan, and Poland.

Over a hundred coded segments including short phrases and sentences were assigned to the umbrella term of Contributing factors of EdTech in teaching and learning. This theme entails participants' views of various opportunities that EdTech can enhance in teaching and learning. By designing matrices I was able to categorise participants' views of EdTech as:

- Enabler and supporter of teachers' pedagogy and subject content knowledge
- Learning gains for students as viewed by families
- Environmental conditions for online learning as experienced by students, and
- New quality of teaching and learning, student engagement, and collaborative learning- EdTech experts' perspectives.

All participants in three research contexts talked at length about each of the categories for the umbrella term of this theme.

4.2.1 Language teachers' perceptions

Demonstrating knowledge of students and resources. A macroview on the use of technologies in teaching and learning defined by teachers related to responding to students' interests and needs in learning. 'So in this job we need to attract student's attention and we need to follow their interests. So if you don't use technology, then the lesson is usually boring for them' (Teacher 1, Poland, Interview). Eight participants emphasised the use of EdTech as an important element to engage students in a lesson, 'So all technological equipment… to make the lesson more attractive' (Teacher 1, Poland, Interview). This view was echoed further

> I can't imagine distance education, especially in elementary school where the visual perception of students, the auditory perception of students is very important. And we managed to keep their attention in the lesson on the main material only with the help of these information technologies (Teacher 3, Kazakhstan, Interview).

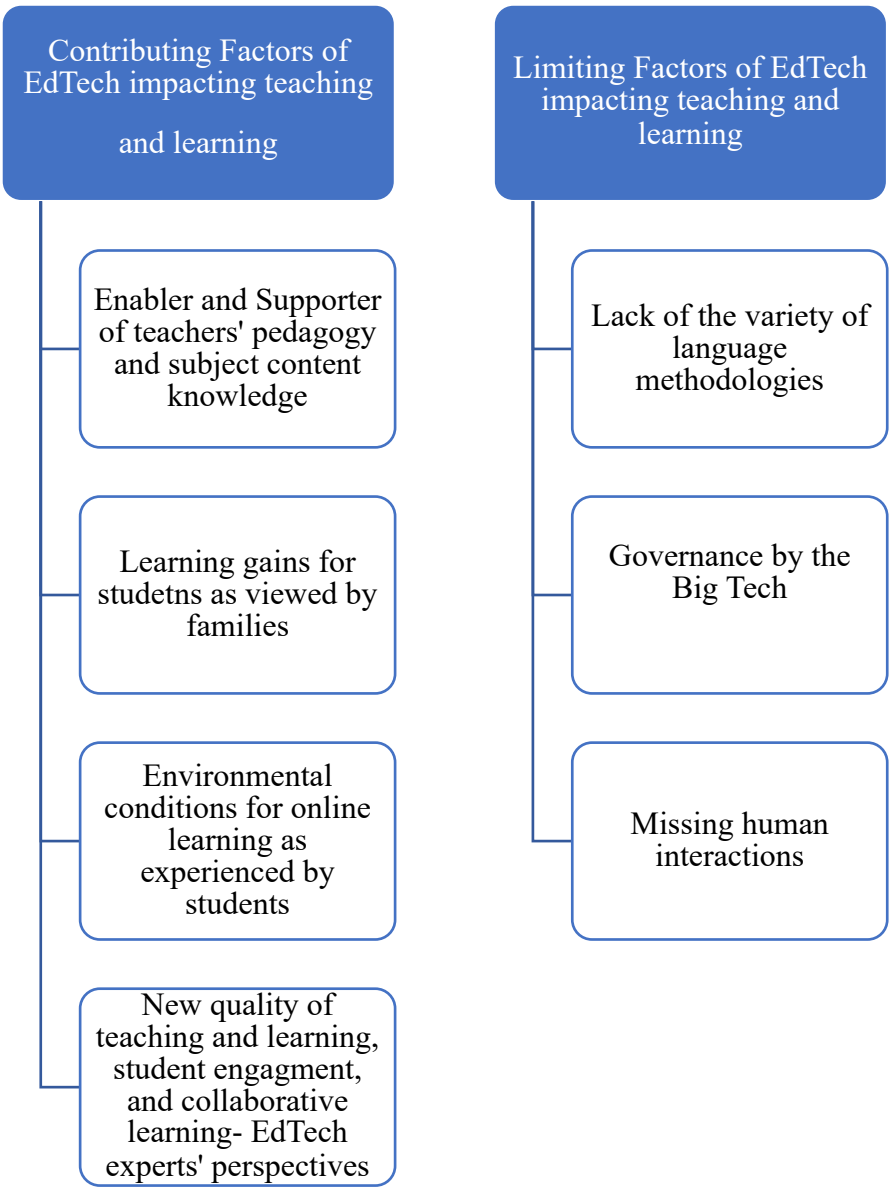
All teachers named at least five different language applications, websites, and YouTube channels they have used before the pandemic in classroom-based language teaching and learning. This included Padlet for brainstorming, topic introduction, conceptualisation of ideas, Kahoot! games and Quizlet for task assessment and Mentimeter for feedback purposes, Word Wall for increasing students' vocabulary, Google Forms as collaborative tools for writing essays and needs assessment tools, local government provided learning management systems (LMS) to register and track students' progress and conduct summative assessment. Based on their previous use of digital tools in classroom-based language teaching and learning, teacher-participants have already been aware of the pedagogical use of these tools. Having appreciated their knowledge of technology affordances for language teaching and learning, teacher- participants witnessed an additional value of tools to meet students' learning needs and their own teaching needs during ERE. Teacher 1, Hungary, enlightened me,

> First of all, I had to rethink the ways of my teaching…what I could use in the case of the lesson, how I could use these applications and these games. And for the students it was really fun. They enjoyed it because it was a game and they really felt like that. That they are playing. So they didn't feel that they have to learn something or they have to practise something. But they felt like they were playing. And they haven't noticed that they are learning.

Similarly, teacher 2, Hungary, added how knowing her students' needs and background information about them helped her identify the digital resources she could include in her language lessons. She summarised,

> I think only information that I have about students I put into my teaching. So when I select which article to read or which video to show them I rely on what I know about them, what they are interested in, what background they have.

Figure 10 Contributing and Limiting factors of EdTech in teaching and learning



In fact, knowledge of students and resources has been common for all teachers in lesson planning and preparation for lessons during ERE. All eight teachers have highlighted the importance of thorough preparation and careful crafting of lesson planning involving a wide range of EdTech. For instance, teacher 3, Kazakhstan stressed upon the accuracy in lesson planning during ERE, '...we tried to carefully approach lesson planning so that everything is minute by minute, second by second. So that everything can be explained to students more clearly and in an accessible and high-quality manner'.

Lesson planning and preparation. Some four teachers valued the importance of lesson planning and preparation for clarifying the extent in meeting students' learning needs. Lesson plan was viewed as one of the tools in responding to changes in learning environments and accommodating students' learning needs. For example, teacher 2, Hungary commented, '...because we know about [home-based learning during ERE] … we adapt the lesson plans'.

As the pandemic expanded, teachers learnt that the traditional approach to lesson planning designed for classroom-based teaching was not fitting lesson dynamics in OLEs. Seven teacher-participants reflected on their bravery in taking up new pedagogical approaches in lesson planning and preparing a classroom environment. Teacher 2, Poland, commented,

> Well sometimes I try to do this lesson in a way that I asked them to prepare for example the text beforehand at home… like an upside down lesson. So first they prepare something at home. And then I follow the lesson with the previous preparation so it gives me more time to discuss, to do some tasks that I would probably not find time to.

Two participants also realised that lesson plans shared via digital marketplaces for teachers saved their time, sparked new teaching ideas, allowed them to learn from others' experiences. This teacher 1 from Poland expressed with excitement,

> I can't imagine teaching without technology. There's no way right now. Even finding the sources. Where are the best sources? Online, right? I also use Facebook a lot. I do. I signed up for many groups for teachers and then exchanged ideas. I can access, I opened my wall on Facebook, and, for example, I have no idea as to what to do today. And I see ready-made lesson plans and I pick them and I have it, right? And it's amazing for me. I wouldn't survive without it, really! That would take loads of time creating different things and here, right now I have ready-made lesson plans.

Three teacher-participants have also discovered that they had to plan for diverse digital communication channels to share their lesson plans with students. Teachers explained that exchanging lesson plans with students reassured them in reaching their lesson aims and being in touch with students. Teacher 2, Hungary, commented,

> Now we're working in Teams. Okay, so I announce the title of the lesson and I show in Teams task one task to task three, page numbers, exercise numbers, everything is there

> [Teams] written out. And when the lesson starts, I send out this lesson plan, so students can see it…I also explain it.

Similarly, teacher 1, Poland, shared, 'when we work from Teams I upload the materials for the lesson so that students see what lesson will be about. I also send them some materials on Messenger so we are in touch all the time'. When asked whether teachers observed any differences between the pace and development of their lesson plans, five teachers highlighted improvisation and knowledge of resources to formulate their improvised teaching in OLEs.

> I'm very flexible with my lesson plans. Because if I feel that a student is frustrated… I rather focus on getting rid of the frustration before moving on. And, I would rather change my lesson plan or the type of activity that we're doing… So I would have some kind of a raw material, at least in front of me from a different website that I would very quickly search for, and then I would improvise through the task.

Five teachers have expressed a range of insights in their approach to lesson planning and preparation with respect to their knowledge of online learning resources. These insights were primarily linked to the organizational aspects of OLEs. As a result, organisational aspects of OLEs changed teachers' instructions taking into account that students used a range of devices for learning during ERE, and textbooks were not students' priority. Teacher 2, Hungary, scrutinised, 'Textbook publishers organise events for teachers when they teach us how to use the digital material… I think the biggest problem is really that teachers know that not every student will use it…the organisational tasks are simply too much'. She then continued, 'Because I don't have regular access to a smart board …I can't really plan my lessons around that. So that's the reason why I don't use them'. Expecting improvements in organising online environments fruitful for learning, teacher 2, Hungary, concluded

> Now I see how badly we are doing it [remote teaching]. So I see the chaos and it really upsets me because I think with good planning it can be done really well. And in my opinion, that can be not only useful, but in a way enjoyable as well.

Demonstrating Knowledge of Content and Pedagogy. Some teachers shared further detail what they valued pedagogically in their chosen EdTech during ERE. An example of this follows for pedagogy, content, and technology domains. When asked about how EdTech facilitates a

teacher in giving instructions with expected outcomes in ERE, during the pandemic, teacher 3, Kazakhstan stated her response explicitly saying:

> We used Google Forms because it has a very easy interface for the student as well and because students are used to it. We always tried to survey using Google Forms so students … would like to defend their topic of interest … they could add new topics and it all is saved in our Google Forms further and in Padlet too.

Teacher 1, Hungary, echoed her colleague from Kazakhstan reporting, 'I usually use the Google Forms… as assessment in … mathematics and in …a grammar test that At the end of the assessment students can check themselves…and they get their points at the end'.

Teacher 2, Kazakhstan, acknowledged EdTech in reassuring that her teaching practices yielded results in students' language acquisition. She described how she used different media sources to practise students' vocabulary skills and check for understanding.

> When we start the lesson or a new unit… I show them, for example, pictures to revise their vocabulary... I use [information] communication technology during my lessons…it really helped me to go to the next stage and we played some games. And answered questions, fill-in- the gap games to check their understanding… I think technology really helped me to go through all the lesson stages.

Six teachers discussed formative and summative assessment practices facilitated by technologies in a different manner. Three teachers (Kazakhstan) reported the use of national learning management platforms that had already contained summative assessment in accordance with the state curriculum. Usually these were tests with multiple choice questions and questions assessing students' critical thinking skills. At the same time, these national learning management platforms enabled teachers to create their own summative assessment tasks fitting the school and class context. Teacher 1 described the use of www.bilimland.kz, 'I mostly use it for summative assessment'.

Teacher 1, Hungary emphasised the crucial use of rubrics for encouraging students' development of writing skills alongside increasing student participation. As teacher 1, Hungary explained, 'I think it's a really good application in a way that students can see the instruction and they can also see what they get a point for'. Teacher 1, Hungary emphasised how EdTech enriched

her knowledge of technologies necessary for language teaching and learning. The teacher recognised that learning about technologies could strengthen her repertoire of teaching skills. In turn, it allowed her to select which technologies could benefit her teaching and her students' learning. For instance, teacher 1 stressed, '…when I try something new, I always ask students at the end... For example, when I used Mentimeter at the end of the presentation I asked them "Was it better in this way? Was it easy to use?'. Furthermore, teacher 1, Kazakhstan talked about how she combined her subject content knowledge with a newly acquired knowledge about technologies.

> It depends on the object of the lesson. For example, to improve writing skills bilimland.kz gives explanations. Then they give opportunities to students, writing prompts, but mostly it's not creative; there can be a lot of critical thinking questions, matching, multiple choice questions. But based on platform creators' suggestions I didn't use the questions connected to improving their writing skills.

EdTech as an opportunity for inclusive education. The teachers consistently reported about how using EdTech in their practices during ERE showed how technologies could welcome learners regardless of their background and reasons for missing school days. Teacher 3, Kazakhstan excitedly stated how state-governed learning management platforms supported students who were on sick leave to continue schooling. She emphasised that, 'In Elorda Mektep (State school- translated) mainly teachers from our capital developed educational content for students from public schools who missed a lesson. Elorda Mektep was an additional resource for teachers. This teacher went further and talked about some of her students who, before the pandemic, used to be shy 'but during online lessons the student became freer'. This student felt shy questioning the teacher during traditional lessons. However, the student utilised EdTech during ERE lessons and so 'some students became more open, more active'. Another teacher viewed the pedagogical value of EdTech in welcoming all her students to demonstrate subject knowledge or perform a skill during ERE. For instance, teacher 2 commented, 'All my children had a chance to answer, to speak during a 20- minute online lesson rather than sitting in front of the teacher for 40 minutes'.

Teacher 2, Kazakhstan voiced how EdTech is valuable in widening learning opportunities for school children who cannot attend schools because of various reasons. In relation to English language learning, the teacher 2, Kazakhstan expressed that children could expand a number of English lessons from home, if they had a chance. In contrast, they could focus on other subjects at school, for example STEM subjects. The teacher shared, 'not all the time students need to go to school to learn English. Rather they can fulfill their knowledge with other subjects, for example in mathematics which are more important than English'. The teacher then stressed that school students need to acquire online learning skills because 'I know that in the near future most of the schools, maybe universities, will work remotely. No in-class participation but online. And students should be ready for this kind of work' Teacher 3, Kazakhstan echoed and extended teacher 2 response, saying

> This is the future of digitalization. It seemed to be waiting for us but the pandemic accelerated this process. On the other hand, this is inclusive content because students who could not attend school… distance education gave them the opportunity, along with their classmates, to receive the same knowledge, the same quality education that they could get at school.

Teacher 3, Kazakhstan has also referred to some of her previous experiences of providing individual teaching to students who have missed her lessons because of different reasons. In this context, the teacher 3, Kazakhstan acknowledged the availability of EdTech in engaging with her learners who might have not received her adequate attention in the absence of EdTech-facilitated learning. The teacher stated,

> There will definitely be one or two students who did not understand the topic or missed the lesson due to illness or a student connected at the end of the lesson because of the problems with the Internet. Then we receive such a request from a student, mostly from parents. We stay for extra time because we have about 15-20 minutes of time between lessons. If a student comes at the end of the lesson, we definitely stay, again we use the same technologies that we used during the lesson. And the student will no longer be interested in hearing material without using EdTech, the student will not understand

because we mainly use presentations, videos, audio files. Students are very accustomed to this facilitation.

Online classroom environment. Safety and rapport with students was the most widely cited environmental condition by teachers valued from a pedagogical perspective in EdTech. In addition to familiar basic features of strong Internet connectivity and access to devices for learning online, five teachers have talked at length about a range of platforms they used during ERE. These platforms allowed them to create a safe environment that would encourage students to join lessons. Teacher 2, Hungary, reflected,

> I think my school uses Teams…I made a list of students who are in my group…no one else is in my classroom or in my groups… it's not an open invitation like I send you a link and anybody who gets this link can join that conference… our system doesn't work like that.

Safety was also expressed in using different online platforms for language teaching and learning in one convenient space accessible to both teachers and students. A common online space for learning meant teachers and students shared the same domain name to access their emails, online classroom and storage space with learning materials carefully selected by teachers and easily accessible by students. Teacher 3, Kazakhstan, deduced, 'Our school decided to completely switch to Google because it is absolutely safe since it is a corporate email'.

Participant teachers were also prompted to express how EdTech should be designed to contribute to teacher effectiveness and supporting student learning. Teachers talked in-depth about elements of interactivity, student engagement, and student assessment as the prerequisites to support them in being effective and focus on student learning.

Definitions of interactivity carried different meanings of the pedagogical value in EdTech to teacher-participants in this study. Teacher 1, Poland, perceived interactivity as idea generation. 'We sometimes use Answer Garden to brainstorm ideas. Students have got it on mobiles, they get the links, and there's a platform where they work, they can write the phrases. And we can see everything on board'. Teacher 2, Hungary, noted the difference between the types of technologies used for communication among their students,

> So students contact each other digitally because that's all they can do now. But I think they kind of separate it from education. So education is for communication with the teacher. And parallel with this, they communicate, maybe on another channel with their mates. But I think they don't always see that this could have that learning as well.

Teachers have also linked interactivity in EdTech to increase student motivation in OLEs. In the conditions of ERE when students had to stay on their own with restricted social interactions the appropriate choice of EdTech could mean greater student engagement for a teacher. Teacher 2, Poland, commented,

> Students prefer to see something on the screen, they prefer to do something in an interactive way. This is why my students who play computer games are really good in English because they communicate with people all over the world. And they don't understand the grammar, they don't go into these details because they just speak. And this is what language is about for me.

Students' age-group was one of the defining criteria for teachers to consider EdTech in raising student engagement. For example, ⅔ of the Kazakhstani teacher sample taught primary school learners. Children from this age group learn better through games and songs, as reported by the participants. Thus, teachers had to consider the level of interactivity of video and song learning materials for their students during ERE. Teacher 2, Kazakhstan, described, 'Our primary school children … are more engaged in lessons with video materials…They learn through singing songs, watching videos, playing games via computers'.

4.2.2 Families' perceptions

In addition to teachers' perceptions, families have provided their understanding of the pedagogical value of EdTech for language teaching and learning. Based on parents' observations, home-based learning facilitated with available technologies was organised with specific details to families' SES and occupational backgrounds, nature of communication styles with teachers, and larger educational contexts in each country. Hence, this section presents and discusses learning gains viewed by families in addition to the teachers' perceptions discussed above.

Facilitating student autonomy. The families perceived the pedagogical value of EdTech as an opportunity for children to create digital learning content, to manage their learning amidst uncertainty, to enhance self-regulated learning skills, and express student autonomy. Another family viewed how EdTech became a space for children to express themselves, to try and create new content, and feel pride for their work. Family 3, Poland, exclaimed,

> …the result was so good that when teachers looked at it [a film clip], they said, I have no idea how to do it… I think that was the moment when she [daughter] felt like 'I can do something special'... since then she [daughter] has this perception that if you need to create a film, she can do it.

All nine families contemplated how technologies narrowed gaps in communication between teachers and students. 'I think that communication with teachers became much easier than before…Because teachers have installed Teams on smartphones…I think that kids after the pandemic don't have a problem with communicating with teachers… they are much more open' (Family 2, Poland, Interview).

A mother from Hungary saw how her child's confidence grew when the daughter had to use digital tools to communicate with teachers. The mother shared a few anecdotal situations with specifics to daughter's learning during ERE in Hungary. For instance,

> I think it's easier to email and write a message to the teacher than to stand in front of her in person.. I think now she [daughter] realised it's not that difficult to communicate with the teacher. I think in this way it gave her some kind confidence (Family 3, Hungary, Interview).

Family 2 from Kazakhstan recognised the availability of information via technologies as one of the channels to access vast amounts of information and communicate with a teacher anytime. The mother from family 2, Kazakhstan, commented, 'Using technologies students may send their answers to the teacher whenever they are able to do that compared to the lesson'.

Environmental conditions for online learning as viewed by families. All nine families have commented how they regarded safety in digital spaces a pedagogically valuable feature of technologies used by children for educational and non-educational purposes during the pandemic.

The degree of understanding safety in OLEs ranged from basic to some advanced knowledge based on parents' knowledge about cyber security. For example, some families (Family 1, 2, Kazakhstan; Family 3, Hungary; Family 1, 2, 3, Poland) had conversations with children about the importance of password management. Some other families watched documentaries to illustrate what harm could be intentionally done in digital spaces (Family 3, Poland). Another family installed a two-step verification system on all devices that children used during remote learning (Family 1, Poland). Occasionally, as parents reported, their children would approach parents for help with using technologies (Family 1, 2, Kazakhstan; Family 3, Hungary; Family 1, 2, 3 Poland) and parents would reflect on the safety in solving children's queries. For instance, Family 3, Poland, analysed,

> I recently realised, Oh my God, she [daughter] has so many accounts everywhere and she doesn't do any password management at all. So I felt OK, I introduced her into really advanced stuff. So she has now set up a password manager, pretty advanced setup. Because I felt her development in technology happened so quickly that she needs to start using advanced things. Not only pleasant good looking things but also some stuff that helps her to stay safe and secure.

Another recurring observation of the pedagogical value of EdTech as seen by parents encompassed a great variety of tools for language learning at any level. Parents named various language applications such as Duolingo or Rosetta Stone, a growing number of interactive media platforms such as podcasts, YouTube, radios available with diverse accents to practice, and interactive tools to improve grammar and vocabulary. The availability and accessibility to most of these platforms with a language learning purpose offered families and children a degree of freedom to choose any type of teacher from anywhere in the world. For instance, family 1, Kazakhstan, commented, 'We can choose a teacher regardless of where s/he is, even if it is in Almaty or as now, in Turkey, and distance is no longer some kind of limiting factor for us'. After a pause, the family added, 'Thanks to these modern technologies we are no longer limited to who we have in school, we have a choice. There is a choice based on knowledge, based on interest, so that this teacher has contact with my child'.

Gamification and instant feedback were the most frequent features of EdTech seen by families as pedagogically valuable for learning. As families had to stay home during the pandemic, they observed how their children enjoyed lessons where teachers exhausted various applications to assess children's language progress through digital games. Additionally, some of these frequently used assessment applications such as Kahoot! instantly provided unbiased, not teacher-led, feedback to students. Family 2, Kazakhstan, noted, 'Teachers may use some special additional competitive tasks for students with a reward, of course. So students can be more engaged and interested in doing and learning English or any other subject'.

Over time, parents have recognised the versatility of digital tools in student assessment. For instance, family 2, Poland referred to Mentimeter and Google Forms as helpful tools, '[Teachers] after the lesson can test what students learned about'.

4.2.3 Students' perceptions

Seven interviews with students lasted for 30 minutes each and were oriented towards their perceptions of online learning overall. While we did not discuss the specific pedagogical value of EdTech, I constructed participants' responses as environmental conditions for online learning as experienced by students.

Environmental conditions for online learning as experienced by students. The majority of students (five students) described flexibility in the lesson schedule during ERE as one of the immediate advantages they have experienced. Participants appreciated an opportunity to engage with lessons via technologies freeing themselves from extensive preparations such as early wake-ups and commuting. Some participants did not feel shy describing themselves sitting in bed in pyjamas and having their breakfast meals as a lesson would start. As the pandemic expanded the participants have learnt the netiquette and their attitudes towards online learning have changed gradually. Students further reflected on other benefits of learning from home online because of the pandemic. Three participants expressed how EdTech allowed them to take notes digitally and organise their learning time and space differently. Three other participants reflected how EdTech expanded their horizons of viewing learning outside of school and textbooks. One participant has also added,

> We received presentations with instructions and tests. For example, I clicked on the link in Google Forms, took a test, sent it, and received the final score immediately. The teacher did not have to spend her time re-checking it and I didn't have to wait for the teacher ['s grading]. (Child 1, Kazakhstan, Interview)

Furthermore, two participants captured the essence of what they considered as engaging in learning using EdTech. One enthusiastically shared her views, 'What worked well and we continued to use it was a collaborative page' (Child 2, Poland, Interview). Two other participants shared the repetitive nature of EdTech that attracted them in online learning. 'You can always return to the lesson topics that you have covered because they remain. The teacher can send them or leave them in the Google classroom room and you can always go back and repeat the topic (Child 1, Kazakhstan, Interview). 'If the teacher explains a topic during a lesson, you didn't understand and asked again and still didn't understand, then remotely you can watch the same video several times or read the notes or ask your parents to explain" (Child 2, Kazakhstan, Interview).

Some participants shared further details as to what they preferred in their chosen EdTech for language learning. An example of this follows for a convenient learning approach and freedom to choose time to learn. 'They [technologies] will be patient and tell you different ways so you understand. And it's good that tasks that are in a playful way, like games, but you still learn and it's more exciting' (Child 1, Hungary, Interview).

4.2.4 EdTech experts' perceptions

There were six EdTech experts who considered EdTech use for language learning as innovative and occurring anytime anywhere. In analysing the dataset of interviews with EdTech experts, I relied on theory-driven dimensions of cognitive and social presences from the Community of Inquiry to answer qualitative research question 1.

New quality in teaching and learning. In this study, all EdTech experts, independently from each other, agreed that educational technologies bring a new quality of teaching and learning. Five EdTech experts repeatedly expressed a connection between being immersed in technologies and receiving learning content anywhere anytime in any form. As EdTech expert 2 from Poland

expressed in our interview, ‘There are a lot of very good videos right now explaining some areas directly on YouTube. And they're using an interesting formula for explaining some difficult things like math or physics or you know, some others’. He later stressed on creating digital lesson content taking into account students’ interests in the types of technologies they use. EdTech expert 3, Hungary, provided a more extensive view. He traced the types of technologies that can be used for different types of learners, ‘I think there are lots of types of education that I can imagine and I think the way technology can help is very different’. Specifically, this participant shared a range of approaches his team and he implemented in online education for language learners, software development and programming learners. For example, in learning languages their company combined Power Point presentations to deliver lectures mixed with a great number of interactions via polling, chatting, and immediate feedback to learners. Gamification and problem solving were used frequently for self-paced learners to cover subject curriculum faster.

Other participants gave a wider response in viewing EdTech as pedagogically valuable as a process. Five participants drew attention to how schools, ‘built for an industrial period’ (EdTech Expert 2, Kazakhstan, Interview) did not accommodate the present type of learners who ‘are looking for technology all around’ (EdTech expert 2, Poland). Five participants talked about teenagers’ approaches to learning such as ‘making smaller batches of knowledge that they [teenagers] have to stop every time they complete it. And then do some sort of exercise that gives them the possibility to apply’ (EdTech Expert 3, Hungary, Interview). Similarly, EdTech expert 1, Hungary, added, ‘I think that is the future. That is the future for teenagers. They have the time to learn whenever they want. They can.. collect the knowledge from pre-recorded classes. And if they have questions, they can go to Coursera or other platforms’.

EdTech experts’ views also surfaced about how technologies can be considered in curriculum design, lesson planning, teacher professional development, and learner assessment. To illustrate, EdTech expert 2, Poland believed that,

> ...classroom teachers can not only use ready-to-go content as we mentioned in the YouTube example … but teachers can also encourage students to be more involved in the process. So what I see is that we can use many different tools… preparing online or digital

quizzes, digital exercises, multimedia exercises, and just use those platforms to create our own digital assignments.

Furthermore, five participants were particularly optimistic about the students' future job and academic opportunities enabled by technology. For instance, EdTech expert, 2, Kazakhstan shared,

> The teacher will draw a triangle on a blackboard and explain to you how Pythagoras theorem works… digital companies do the same, but in a digital way.. the child sees a 4d movie in which there is an F1 race, how the tracks are made, and how Pythagoras theorem was applied to build the tracks of an F1 race…so we are focusing more on this knowledge, we are not trying to repeat the classroom.

Another EdTech expert 3, Kazakhstan firmly stated the following,

> Because technology allows us to be very granular with data and allows us to be very specific, we can start to look at how personalisation comes into the equation, and what kind of things each person really needs to succeed. And that is really exciting because that's where we start to look at it from a teaching perspective.

Student engagement. Based on our interviews with EdTech experts, teachers who considered expanding their knowledge on the affordances and limitations of technologies used for teaching and learning were more likely to strengthen student engagement in OLEs. All participants gave numerous examples of how technologies can be applied in different lesson planning and classroom instruction stages to research a problem, generate ideas, and potentially synthesise knowledge. Two participants have been particularly attentive to the fact that technologies' affordances of assisting learning heavily depends on teachers' technological and pedagogical knowledge, school curriculum, and access to technologies. Furthermore, some participants (EdTech experts 2, 3 Hungary; EdTech experts 1, 2 Kazakhstan; EdTech experts 1, Poland) reported that as learning facilitated by technologies becomes personalised, cognitive gains for students might be diverse. For example, EdTech expert 1, Poland shared

> imagine … a school where students are learning how to fix cars and they probably do not have every single type of car in the school to check…in virtual reality there are

applications prepared by the car manufacturers which help to understand this car, showing this in VR, engaging students to be more deeply in this particular topic.

Other responses to this question included 'Learning does not happen only during the video or in the online meeting. Learning has to take place before the meeting' (EdTech expert 1, Kazakhstan, Interview).

Some EdTech experts responded honestly (EdTech experts 2 and 3, Hungary) about student performance measures and student engagement metrics. These participants expressed why increasing levels of student engagement was necessary for EdTech companies. 'Key metric for us is engagement. Because if people are engaged and they are learning, they are willing to learn more and they are paying us. So basically that's the pretty easy reasoning behind this' (EdTech Expert 3, Hungary, Interview). In other words, EdTech Expert 3, Hungary, explained how language applications use various metrics and mechanisms to convince a learner to continue using the technology. 'So all the companies including ours, we track anonymized data and we see exactly the engagements at different points through the lifecycle of the offering'. Applications employ 'psychological manipulation…influencing techniques to get people hooked'. In our interview EdTech Expert 3, Hungary, reflected 'I think there are genuine EdTech companies out there that really want to teach' and 'some who just want to increase their engagement scores…Because at the end of the day, it's a business which pays salaries to people so they're trying to sustain it'.

Furthermore, participants expanded their understanding of student engagement by broadly speaking about including gamification in learning and collaborative learning. Some participants have spoken about gamification at length, addressing diverse age groups. For instance, EdTech expert 1, Poland was particularly excited to share one of the leading technologies in STEAM for schools in Poland,

> The first thing that you think of is engaging. Because the things that teachers have in school right now are not engaging…the best example I think is Photon robots. It teaches, but the main thing is that it's a robot. So kids already love it. Because it's so crazy having robots in your lessons, and it teaches.

Commenting on gamification and ensuring cognitive presence in EdTech, expert 3 from Hungary believed in 'gamification and interactive elements make the class more

engaging…frankly, we will move into this space a little bit as well in terms of helping actually the teacher-learner collaboration'.

Other EdTech experts, who were not involved in mobile language or programming applications, viewed gamification differently. According to them, gamification should be aimed at SL regardless of the environment. For example, EdTech expert 1, Poland emphasised how secondary and high school students, who are deeply immersed in technologies, challenged teachers' skills to adapt their pedagogy accordingly. Overall, the participants viewed EdTech as a valuable pedagogical tool that can enhance teaching practices, strengthen learner engagement, and equip students with essential 21st century skills and knowledge.

Collaborative learning. EdTech experts consistently expressed the view that technologies serve as collaborative tools in strengthening teacher effectiveness and fostering student learning. Five EdTech experts specifically noted the practical features of EdTech tools, such as breakout rooms, file sharing, chat-based student communication, and the organisation of home assignments within accessible folders. These features were found within widely used video conferencing platforms in studied research contexts such as Zoom and MS Teams. Notably, four participants acknowledged that Zoom and MS Teams, initially developed as business communication tools, underwent significant enhancements in response to the COVID-19 pandemic demands in schooling. By offering teachers and students communicative collaborative means, these videoconferencing tools attempted to replicate familiar classroom experiences in the digital realm.

Theme 2: Limitations of EdTech in teaching and learning

This theme addresses participants' perceptions of the limitations they have experienced in EdTech during ERE. The limitations reflect the experiences and observations of language teachers and families, and joint views of students and EdTech experts.

4.2.5 Language teachers' perceptions

Lack of the pedagogical support for various language methodologies. This category in the theme of limitations of EdTech in teaching and learning refers to language teachers' views on the lack of the pedagogical support for various language methodologies. Given the range of

students' age groups that language teacher-participants taught, this category reflects on language methodologies for primary school learners and high school learners.

High school language teachers mainly referred to the low quality of pedagogical support in EdTech for effective language teaching and learning. In contrast, primary school teachers reflected on excess screen time leading to students' sedentary behaviour.

Five teachers identified disruptive features in EdTech restricting their student-oriented teaching. Poor tech solutions in conducting group work online for learners with mixed abilities was cited the most by teachers followed by difficulties associated with giving instructions online for diverse audiences. Teacher 1, Kazakhstan, expressed her frustration, 'I decided that group work online is difficult because students didn't understand instruction correctly or they asked about it many times'. Similarly, teacher 1, Hungary, angrily commented,

> Our school uses the Google Classroom. And I really hate it!... because Google Meet doesn't work very well in giving out tasks, homeworks…students cannot join the meeting or they can't use their microphone. They are always signing out and signing in because the Meet kicks them out.

With regards to students' age groups, teacher 2, Hungary, compared grade 11 and 12 with primary school learners. While with primary school students it is easier to work in groups online in Zoom or in Teams, with grade 11 or 12 students a teacher needs to be cautious in planning learning activities online. Teacher 2, Hungary cautioned,

> We have exam preparation lessons in the 11th and 12th grades. There are even bigger differences, students don't come from the same class. So they are a little bit more shy with each other. And then you have to be careful not to expose them, not to hurt them if they don't know something. You have to be a lot more careful in the digital world because you are not in the same environment and you cannot use your personal senses.

Teacher 3, Hungary specified a lack of language methodological support in EdTech she used during ERE, 'If I don't have breakout rooms the only thing I have for instruction is frontal teaching. And frontal teaching in language education does not work. There's very low efficiency'.

4.2.6 Families' perceptions

Governance by the Big Tech. Three families discussed the connection between nationally provided EdTech compulsory to use during ERE and a combination of free language applications and the Big Tech from the perspective of inadequacies in digital governance. To begin with, family 1 was vocal about the absence of national strategy on the digitalisation of K-12 education in Kazakhstan. Family members believed that ERE chaos and disorganisation could have been reduced with clear legislation. Further, family 1, Kazakhstan discussed how defined roles and responsibilities for various parties would have helped to alleviate stress for all school stakeholders involved in ERE.

In comparison, family 2, Kazakhstan reflected on the compulsory use of local platforms provided and recommended to use during ERE by the Ministry of Education and Science of Kazakhstan. The family described technical dysfunctionality of www.kundelik.kz in unfair student summative assessment. The design of the platform www.kundelik.kz for summative assessment regarded student's input only once. When children from family 2, Kazakhstan realised they had an error in their summative assessment and intended to correct it, the platform did not respond to their queries. Family 2, Kazakhstan had to consult with teachers to consider students' error corrections discovered by students themselves. However, the teacher could not accept it because, 'School principal could see what the teacher was doing and I guess there were some cases when teachers were trying to help the students…I don't know how it works, but teachers are really afraid of…'.

Family 1, Hungary recognised that nobody was prepared for the online teaching,

> I recognise that the government cannot manage on that level…as a citizen in this country I realised…if we can't continue teaching nationwide that will cause a lot of effect in the future. So I came back to the educational industry last year to figure out how we can support digital transformation in education.

4.2.7 EdTech experts' perceptions

Missing human interactions. In EdTech experts' views, social presence is desired to be built into educational technologies. Yet, as EdTech expert 2, Poland has implicitly worded, 'There will never be such an effective lesson when we do not go and talk directly to the person. So maybe there is a lack of this element in the platform but I have no idea how to fulfill it'.

The majority of EdTech experts voiced that while 'we can actually move the whole teaching and learning process to the digital world' (EdTech expert 1, Kazakhstan, Interview) lack of socialisation is "one of our problems at the moment…of online learning" (EdTech expert 3, Kazakhstan, Interview). Three EdTech experts noted that because we, humans, are socially different and social interactions are important for learning, sharing a screen and several thousand kilometres between peers in OLEs represents a psychological barrier. While technologies are being developed such as virtual, augmented, and mixed reality, social presence becomes 'on a different level, not physically social. It's social on a meta-layer (EdTech expert 3, Kazakhstan, Interview). Another participant added that current technologies cannot provide the social aspect in its traditional understanding. The participant gave an example of how holograms can be used to reproduce a feeling of social presence in OLEs. The participant said, "a hologram should be as close to real life as possible…in a distance learning' (EdTech expert 3, Kazakhstan, Interview). While some participants struggled to imagine how social presence can be elaborated in the future, others saw an opportunity to build communities as a solution. Engaged in conversations about the lack of social presence in EdTech, EdTech expert 3, Hungary firmly stated their beliefs about learning in OLEs. For example, this participant commented,

> I am a huge believer in community-based learning…because that actually replicates that social interaction… I am still a believer that this is the way forward…If you build out the community outside of your product that helps people learn…community of interests where people may come together to learn.

Other participants have echoed EdTech experts' views on missing human interactions. I will continue this topic with other participants' views in section 4.5 and in section 4.8. Concluding, together these findings provide important insights into how EdTech product designers, e-learning

developers, instructional designers, and educational leaders perceived the pedagogical value of EdTech in student learning and teacher effectiveness.

4.3 RQ2:How did teachers, families, and students shift from traditional learning environments to online learning environments?

The purpose of research question 2 was to identify how roles of families and language teachers changed in supporting student learning during the COVID-19 pandemic. Because of the pandemic restrictions on social interactions associated with health measures for groups of people at-risk, both children and teachers struggled with the social isolation and distance in learning. These two factors so highly valued in how learning occurs were absent from a natural teacher-student habitat during ERE. Hence, this section presents and discusses findings of this mixed methods convergent parallel study as voiced by teachers, families, and students. By organising my data in coding charts I was able to identify participants' shifts to OLEs as an Emotional roller-coaster. Figure 16 below depicts participants' emotions. In analysing families' responses I was able to elaborate three categories describing a change in families' roles in supporting student learning during ERE. By developing matrices on the analysis of students' interview data, I constructed the changes they described in study habits and attitudes to learning by using an in-vivo code 'I was doing nothing the whole year'.

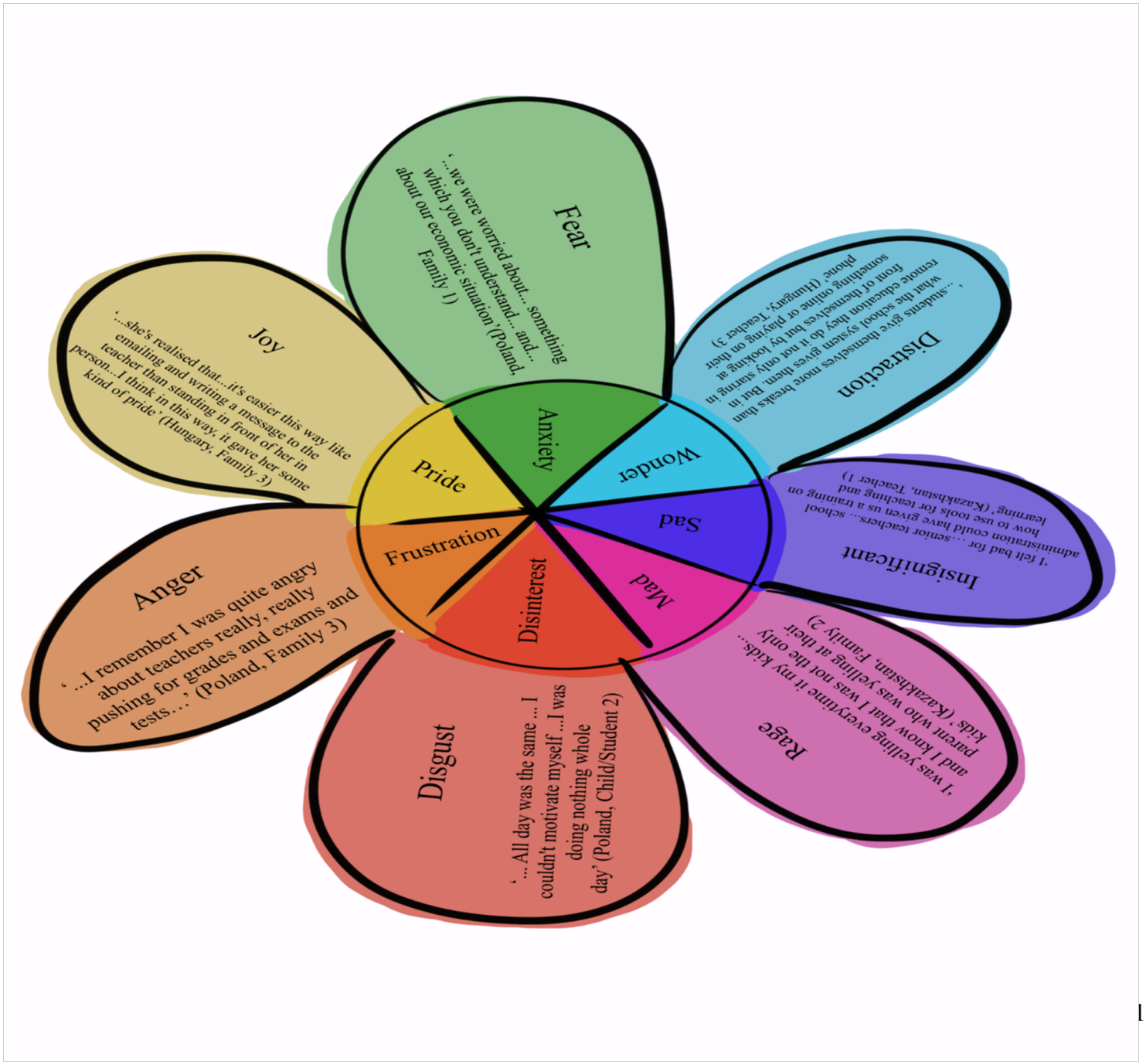


Figure 11
Emotions of the participants reflecting their shift to emergent remote education

Theme 3: Emotional roller-coaster

4.3.1. Language teachers' and students' perceptions

For the total number of teacher-participants essential changes happened along the journey. These participants say that they missed the 'hustle and bustle of school' (Teacher 2, Poland, Interview) of a school environment with students' interactions and chatting to colleagues in the teacher's room. For others the changes were associated with increasing anxiety and worries of the uncertainty during the pandemic. One of the factors that helped Teacher 2, Hungary stay optimistic in adjusting to online teaching during the pandemic were her students. She described how earlier at the start of the lockdown in her home country she was fearful and depressed. As her online teaching progressed and she learnt about her students' coping skills, she changed her attitude,

> I was really depressed last spring [2020] as well because I was worried about them [students], how they would take their final exams. So I was terribly frustrated. I felt helpless that I couldn't reach them. I cannot keep them together. I can't do anything…some of my students last year from my class sent me daily routine programmes. They said when they get up, when they have breakfast, when they have lessons online, and they go out with the dog or they cook …And then I saw some of these essays about How COVID has changed my life. And some of the students were coping better than me. That's it, I should, I should, you know, raise my head, look up at the sky and not just at my feet and, just tumble and worry and get stressed, but I should learn the skills from them. These ideas inspired me. Some of them have me in their hands.

'I was doing nothing whole year' (Student 1, Poland, Interview). *A* common pattern of coded data in six students' responses was framed around social isolation, missing friends, missing recess time in schools, and regrets about learning losses. The text below includes a description of a personal journey in discovering what mattered for student 1, Poland in learning and regretting a missed year of learning.

> I didn't know how I did it [organised learning time] because… being honest, I didn't learn a lot. Sometimes I read something. But I didn't learn a lot. I feel like I was doing

> nothing the whole year. Like seriously, when I think about it I feel like I was doing nothing. I was sitting in my room, switching on the computer, listening to someone talking from the computer. And I don't remember anything from that. And I am feeling like I was doing nothing the whole year or half.

Another participant emphasised how she discovered herself because she had some free time during learning from home because of the pandemic. The participant mentioned she did not have close friends because it was a new school for her, so she did not have time to develop relationships with some teachers or classmates.

> When I was in school I was a bit different. But since I was alone, I kind of figured out stuff. I thought of how I acted in school and what I could change about myself. Just I wasn't really focusing like what happened that day…because I didn't go to school so I could just think of what I could do and felt …some people didn't like me and I would like to be in good times with everyone as friends…So I can just think about…what I could change about myself. Is it more about, you know, building relationships with other people around you? I don't really think I changed in writing homework… (Student 1, Hungary)

Similarly, student 1 from Kazakhstan emphasised how learning from home because of the pandemic gave her an opportunity to learn about herself. The student described how she became courageous in participating in class activities when she was behind the screen. In turn, it made her analyse the distractions she was surrounded with in traditional classrooms. She said,

> So I began to behave actively in class and no longer pay attention to the presence of other students. And it seems to me that my attitude has also changed. Because it seems to me that it is connected not only with distance learning, but also with the fact that I am in the 9th grade and I will have state exams, and I will also need to prepare.

Theme 4: Changing Roles of Families

Categories of codes are organised as follows: Family as educational providers, Family as a learner, and Outlier. The following text illustrates a synthesis of interview findings based on nine interviews with three families in each case study.

4.3.2 Family as educational providers

The category of families as educational providers resulted in _ codes across three case studies. It captures participants' views on how their primary role of families as caregivers has *c*hanged to becoming teachers alongside organisational aspects of schooling. Some of the participants' quotes below illustrate common participants' experiences,

> Each of my sons has their own desk, laptops, and lights. We have organised everything for them so they don't need to run from one room to another to take their books or whatever because they lose a lot of time. (Family 2, Kazakhstan, Interview).

> We live in one of these old fashioned large city apartments you know… tall ceilings and large rooms. Son's room is about 25 square meters…he has a piano, a queen size bed, he has his desk and he has his workout equipment and a reading corner with a big bookshelf. (Family 1, Hungary, Interview).

> So that would also be my IT support role. The printer doesn't work or the paper got jammed or whatever that is… And then it's also making sure that they [children] actually do what they do or trying to do it. (Family 1, Poland, Interview).

As we spoke in our interviews, families noticed '.. kids, well… Now I realise how different they are' (Family 1, Poland, Interview) that sometimes 'we start to be more psychologists. Because sometimes we need to solve the problems or sometimes we need to just
talk with, talk more with children about things that we have around, for example, lockdowns' (Family 2, Poland, Interview). Some families (Family 1, 2, Hungary; Family 1, Kazakhstan; Family 1,3 Poland) confirmed that their parenting styles in providing freedom to their children has intensified during the pandemic; some other families (Family 2, 3, Kazakhstan) have discovered during the pandemic that children were in need in freedom and autonomy.

Family as a learner

Family as a learner reflects participants' views and experiences on how their learning about their children has increased. In addition to learning about how online education should be set up, the families participating in this study recognised the lockdown months as both positive and restricted experiences. Some of the quotes below demonstrate some of the families' realisations.

> There were a lot of lockdowns. Technology pandemics do many things well because people learn tools and love ICT. In other words, without the pandemic or e-learning, they probably don't know each of the tools (Family 3, Poland, Interview)

> …me and my ex-husband helped our daughter a lot. I mean we explained her history related to Hungarian literature, mathematics is very difficult and she didn't get enough explanation from the teacher, so I think it was a very tough time as a family, because we were working full time and after work at six o'clock we sat down and by nine o'clock we were revising what she learned, what she doesn't understand. I think parents have given a huge part to this remote education, especially last year (Family 3, Hungary, Interview)

While all nine families recognised the organisational benefits of learning from home during the pandemic, i.e., no need to wake up early, commute to school, worry about lack of nutritious lunch meals at the school canteen, drive child(ren) to extracurricular activities, only two families (Family 3, Hungary; Family 3 Poland) enjoyed the time of staying at home with their children and taking care of them.

> Actually, we loved it. We loved it. So this social component, yes, we understood that she needs more contact with classmates and conflicts with them. Resolve them. But from our family point of view…at times when we were so angry and annoyed, the best that we could do was just hugging. (Family 3, Poland, Interview).

Some families (Family 3, Hungary; Family 1, 2 Kazakhstan; Family 1, 2, 3 Poland) have also learned new knowledge about teachers. Some of them cited how teachers were forced to be out of their regular habitat. Families empathetically reflected on teaching as a profession and contemplated how teachers might have been struggling emotionally during the pandemic.

Outlier

Family 2, Hungary contrasted greatly with other family-participants. There were no patterns in codes similar to other families. Nevertheless, it was noteworthy to code and include this family's response as well. This family consists of two parents and two children, a toddler and a 7th grader at the time of recording our interview.

The father demonstrated in his responses no drastic changes in their family life or in his son's learning caused by the pandemic worldwide. 'I had the same life last year that I used to have before' meaning he continued going to the office because of the nature of his job. His son used to have a private English language tutor for a few years before the pandemic. Hence, the child felt accustomed to studying online; the child had access to strong Internet connectivity and a range of digital tools for online learning. The family did not struggle financially to provide suitable learning conditions for the 7th grader.

In response to whether his role as a parent changed in relation to his child's learning, father confidently responded, 'For eight years, he had a 4.8−4.5 grade point average. He didn't have any problems with learning... And I don't have to ask him, is it really a five or four [grade]?"

4.4 RQ3: Types of challenges teachers faced in switching to emergent remote education abruptly

As expected, learning and implementing ERE via EdTech did not occur without overcoming challenges and putting significant effort from teachers. Themes related to the types of challenges that teachers faced as viewed by language teachers, students, families, and EdTech experts. It included categories of the Digital Divide, Teacher knowledge-specific, Curriculum-specific challenges, and Learner-specific challenges as analysed from interviews with school stakeholder participants. Table 25 summarises the themes and categories through a number of coded segments in interviews with the participants of this mixed methods convergent parallel study.

Table 26 Types of teacher challenges as seen by study participants during ERE across research contexts

Types of challenges teachers faced in switching to emergent remote education abruptly- Research Question 3		
Type of challenge as mentioned by teachers	Number of interviews with teachers talking about a challenge	Views shared by other participants
Digital Divide	8	Yes
Teacher knowledge	6	Yes
Curriculum-specific	4	-
Social presence-specific	5	Yes

Theme 5: Types of teacher's challenges in implementing emergent remote education

4.5.1 Digital Divide

Emergent remote education caused by the pandemic made participants question in-depth about availability and accessibility to various resources for teaching and learning. Participants reflected on experienced levels of the digital divide including lack of school support in providing additional training for teachers and equipment for remote teaching. What follows is a synthesis of participants' responses with some supportive quotes.

Digital Divide referred to teachers' personal stories of experiencing various levels of issues related to a) poor Internet connectivity, b) accessing local and learning management systems from the Big Tech such as Google services, Zoom, Teams, c) lack of digital competency to connect to video conference platforms to conduct lessons, share screen, and provide lesson feedback via emoticons. Additionally, only two participants (Teacher 3, Kazakhstan and Family 3, Poland) talked about overcoming level 3 of the digital divide and creating digital content for teaching and learning purposes. Furthermore, Teacher 3, Kazakhstan was the only participant who volunteered to record video lessons for students from rural areas in Kazakhstan. Lessons for primary school students were broadcasted nationally on two TV channels, 'We created a small content of our video lessons according to the State curriculum for the second, third, fourth grades…we used the Online Mektep platform too'.

Five teachers continuously reported about level 1 of the Digital Divide across case studies. Teachers reported their observations in increasing gaps among students with varying degrees of availability in devices and internet connectivity. As a result, these widening disparities did not allow teachers to plan and deliver student-oriented lessons. Teacher 2, Hungary, shared,

> So I think for interest, motivation and authenticity, EdTech is extremely important. For this, however, you need to have reliable equipment and you need to have the students have access. And there shouldn't be inequality in what students have.

Problems related to the lack of school support included shortage of devices for remote teaching (Hungary and Poland), lack of training on the use of EdTech, especially for senior teachers (Hungary, Kazakhstan, Poland), absence or shortage of Internet connectivity in teachers'

households (Hungary,Kazakhstan, Poland). Teacher 3, Hungary, uncovered a challenge revolving around the uncertainty of available equipment for remote teaching purposes. During ERE this teacher faced a challenge of managing a large workload of 25 lessons per week, often improvising and navigating logistical challenges during short 10-minute breaks between classes.

Teacher 2, Hungary, described typical challenges of teachers working in public schools. In addition to level 1 of the digital divide and the lack of technologically equipped classrooms, teachers from public schools frequently needed to prepare alternative lesson plans to compensate for the lack of digital technologies. Teacher 2, Hungary, concluded, 'I see how it [lack of equipment and digital tools] stops my colleagues from investing too much time and energy into designing lessons like this'.

Teacher 2, Poland, introduced herself at the beginning of our interview in the following way, 'I'm from the generation that had some problems with this, you know (giggles). I wasn't born with a computer (laughs), like teenagers now (laughs). So it took me some time to get used to it'. Concluding our interview, this teacher reflected, 'As I told you, I graduated when I was 40. I think I have always wanted to teach…I'm really happy about it'. This evidence is of a teacher, belonging to an older generation, who did not grow up with computers and learnt to adapt to using them in her teaching.

Families, students, and EdTech experts across case studies voiced the same types of challenges described above. Families considered schools as responsible bodies in providing equipment for teachers who were forced to work from home. Students and EdTech experts regarded generational gaps as the most striking gaps in teachers' lack of digital skills. Additionally, EdTech experts viewed teacher demographic variables such as subject discipline and type of school as mediating variables of teachers' technological pedagogical and content knowledge. The next section sheds more light on this topic.

4.5.2 Teacher knowledge-specific challenges

'It began when teachers were not prepared. We were surviving. We did what we knew'. Teacher 1, Kazakhstan opened her story of how her colleagues, and she struggled with ERE implementation at the beginning of the pandemic. This teacher learned how to use Zoom via YouTube tutorials. In contrast, her senior colleagues faced difficulties due to their lack of expertise

in applying educational technologies for instructional purposes. As teacher 1, Kazakhstan expressed,

> Once we had a lesson in TEAMS about how to use learning platforms. A 60- year old colleague had to demonstrate how to use open digital resources for remote teaching. But the teacher did not even realise their presentation was shared with the audience when the virtual conference call started.

Teacher 1 was unhappy with the school administration's decision on assigning senior teachers as teacher trainers. She later addressed her concerns to the head of the Language methodology department. The school administration responded to the teacher's concerns, subsequently arranging another training session.

Teachers in all three case studies have been unanimous in reflecting on the types of challenges they faced with ERE implementation, especially at the beginning of the pandemic. The challenges related to the lack of teachers' knowledge and skills to translate their pedagogy to online settings can be categorised as insufficient knowledge in the following domains:

- Technological Knowledge (TK)
- Technological Pedagogical Knowledge (TPK)
- Technological Content Knowledge (TCK)
- Technological Pedagogical Content Knowledge (TPCK)

For instance, teacher 1, Hungary evaluated her experience of adapting to teaching online. The teacher expressed that she did not anticipate how different online teaching would be from traditional classroom-based teaching. As we spoke, teacher 1, Hungary acknowledged that online learning did not mean her talking to a computer. Instead, she had to learn to adapt her language pedagogy and subject matter knowledge to the specific environmental conditions of OLEs. The teacher also reflected on her relatively short length of teaching English, 'I had to rethink everything. And as I'm not a very well-practiced teacher because as I mentioned, I had been teaching just for six years, which I think is not a long time'.

Teacher 1, Poland felt terrified using MS Teams to promote students' language development systematically, '...as I said the challenge was creating these short communicative activities before Breakout Rooms. It was like a lecture, so it was terrible. Really, it was terrible.

And one person speaking, other listening, so it's not the language, no'. Teacher 2, Poland regarded TK as 'I wasn't very skilled in all this IT stuff' recognising 'It was a big problem at first for me'.

Overall, parents viewed teachers' lack of TK, TPK, and TCK as the most widespread challenge in three case studies. In addition to levels 1 and 2 of the Digital Divide, families emphasised teachers' lack of experience in online teaching. Specifically, families observed a long-term adaptation of teachers to teaching online, poor assessment techniques, and functional use of technologies for lecturing or reading. Family 3, Poland, evaluated teaching during ERE as 'I haven't seen any creative way to use the technology that is already there to make it more interesting, more engaging, things like that. It was like just transitioning from the classroom to Microsoft Teams in this case, that's it'.

Despite these barriers and insufficient types of teachers' knowledge cited above, the challenges brought some benefits for teachers and students. Teachers (5) continuously reported on the improvement of some of their digital skills such as digital content creation, editing videos, using interactive tools such as Google maps to have students learn collaboratively and develop language skills.

4.5.3 Curriculum-specific issues

Teaching remotely during the pandemic made teachers question their curriculum, its orientation toward low-thinking skills in Bloom's taxonomy, lack of cross-curricular connections between subjects, and orientation towards testing and grades. Teacher 1, Kazakhstan was concerned about the lack of transferable themes in the school curriculum. She discovered it when her high school students struggled with using vocabulary in writing activities during ERE. 'For instance, if we are learning organic and non organic food, I don't know what they are learning in biology or chemistry. Some of them will remember [the vocabulary]' Teacher 1, Kazakhstan noted that the complexity of the school curriculum does not let all students accomplish it. 'Only two or three students out of 15 could complete it at 100%'. When asked how EdTech could solve this issue, teacher 1 voiced her opinion, 'When tasks are not given in a traditional way. Maybe to include some movie episodes that teachers could refer to the usage of vocabulary, some grammar and .. speaking… It should be interesting, engaging'.

Teacher 2 from Poland alluded about the lack of flexibility in the curriculum to conduct online lessons. The challenge was in creating a pool of online resources that students could have accessed and interacted with. Given the teacher's knowledge of the issues of unstable Internet connectivity among some of her students, the teacher was limited in developing lessons with a preferred language methodology outside of the requirements of the curriculum.

Another restriction in the school curriculum was in the misalignment between the subject curriculum's objectives and its content. Two participants from Kazakhstan noted a lack of a coherent progression in the goals and expectations within the content in English subject curriculum for grade 11. Teacher 1, Kazakhstan, regrettably stated, 'I can spend one week explaining Passive voice and students can forget it in the second term. There is no sequence'. As for the Hungarian teachers, none of them noted any challenges related to the subject curriculum.

When asked whether teachers used home-based learning during the pandemic in their teaching, six teachers (Teachers 1, 2 Hungary; Teachers 1, 2, 3 Kazakhstan; Teacher 2, Poland) stated the limitations of the curriculum. They emphasised how they found the subject curriculum limiting them in the choice of topics, learning materials, and assessment. Furthermore, some teachers talked about cheating as one of the negative outcomes of ERE connected with the curriculum. Specifically, seven out of eight teachers across case studies viewed cheating among learners of all ages.

There was only one teacher (Teacher 3, Hungary) who did not view cheating, widely spread and increased as ERE expanded, as a threat to learning. Instead, teacher 3, Hungary believed that when students use the Internet as one of their skills, it should be considered as a learning, 'if the idea is not to get out of work but to learn through searching, whatever they're searching for, then I think that can be incorporated into the learning process'. Seven other participants held different opinions about students using the Internet while searching for answers during online learning. Their views could be classified as teachers' disappointments (teachers 1, 2,3 Kazakhstan; teacher 1, Hungary) and teachers' acceptance (teacher 2, 3 Hungary; teacher 1, Poland). Teachers shared their disappointment about observed learning loss among high school students during the first months of the pandemic (teacher 1, Kazakhstan; teacher 1, Hungary). Primary school teachers mainly observed parents completing their children's works. This was present in both formative

and summative assessment type of tasks in primary school in Kazakhstan. Interestingly, teachers with Master's in English philology acknowledged students' use of the Internet during tests to achieve the desired grade. However, these teachers (teacher 2, 3 Hungary; teacher 1, Poland) stated that students shall be entrusted with using different skills to achieve a task completion. These teachers viewed their role in assessing student's final work and discussing paths for improvement. Given that students could use any tools to self-correct themselves, these teachers (teacher 2, 3 Hungary; teacher 1, Poland) spoke mainly about high school students, their motivations, and responsibility in learning English. For instance, teacher 2, Hungary held an opinion on cheating,

> when you leave school, you step into life … nobody will ask you if you speak English. They will expect you to speak English, you will have to read the articles in English, you will have to make your presentations in English and no one will care about whether you handed in this test or you cheated in this test or whatever you did.

4.5.4 Social presence related challenges

Unanimously, all participants reflected on the loss of social presence in online learning. However, the views held by the study participants diverged; some of these views related to student engagement differed from the perspectives of EdTech experts concerning the contributing factors of EdTech in teaching and learning (see section 4.3.1).

Teachers' views. Some teachers- participants indicated ERE hindering their non-academic relationships with students. Teachers voiced their worries about changes they noticed in students because of the home-based learning during the pandemic with restricted social interactions outside homes. Teachers described how simultaneously they lacked student interactions and worried about their home situations. Furthermore, teachers noted a decrease in students' engagement with learning, with the teacher, and classmates. One explanation of the marked students' decrease in class interactions was rooted in students' weak Internet connectivity. Teachers said that everyone including teachers themselves had to regularly switch off cameras to maintain online connection during the lesson. Another explanation, expressed by teachers, was in students' multitasking during ERE classes. For instance, students could log into online classes with switched off cameras and microphones and be present in WhatsApp chats at the same time.

Students', families', and EdTech experts' views. In contrast to teachers, other participants held different views on an increasing loss of social presence from the teacher's side. Families and students spoke about teachers' difficulties in creating socialised learning opportunities in online formats. EdTech experts stressed on a growing need for everyone to interact socially, face-to-face, in spite of vast opportunities of EdTech to distribute quality learning to many.

First, all families and students across case studies spoke about how teachers were unable to create interactive opportunities for students during the pandemic. Families, for instance, viewed teachers not only as sources of information but also responsible for social learning groups in online formats. On one hand, families recognised that teachers were overwhelmed with sudden change of teaching and learning formats. On the other hand, families expected teachers to adapt and adopt communicative strategies for online learning and have the right attitude to utilise EdTech for these purposes. As Family 1, Poland expressed, 'It was more of a one way communication. I don't think they would go to the teacher and ask in, let's say, a group environment'.

Next, students expressed their frustration with the absence of teacher social presence to receive instruction and guidance. Regardless of age, students-participants talked about missing academic relationships with teachers. These relationships included teachers' guidance, facilitation, direct instruction, and timely feedback on their performance. For example, students aged 15 and 17 years old (Student 1, Kazakhstan and Student 1, Poland) needed teachers' presence to explain learning concepts and inputs in exam preparation. Other students aged 10-12 (Student 2 and 3, Kazakhstan; Student 1, Hungary) realised they missed the school environment and spending free time with teachers. In addition to being restricted to meet their friends, students emphasised their connection with teachers was minimised to receiving instructions on deadlines and spotted errors in home assignments.

Third, EdTech experts recognised teachers' challenges in adapting to learning online because of the absence of teacher training and preparation for online teaching and learning. All EdTech experts across case studies shared insightful views on how technologies can be used to build learning communities online. However, they all recognised that teachers did not capitalise on the opportunities offered by technologies for learning because they were untrained and unprepared for non-traditional formats of teaching and learning.

In connection with some of the teacher-participants' concerns of academic misconduct among students, some families observed cheating in their schools during the pandemic. For instance, Polish families (1 and 2) witnessed a striking difference in their children's classmates' grades during the pandemic. The students (1 and 2, Kazakhstan; 1 and 2, Poland) witnessed their classmates cheating during summative assessment. When Polish families (1 and 3) addressed an issue of cheating to their school administration, the schools rejected this issue among their student body. Nevertheless, parents expressed in our interview their concerns with the school administration unwilling to handle this academic issue.

4.5 Conclusion of a Qualitative Approach in Mixed Methods Study

To deepen understanding and explanation of the themes that I constructed from the analysis of participants' qualitative data across countries in this study, I combined discrete pieces of data into an evidential chain (Miles & Huberman, 1994). I have observed a pattern of valuable insights that allowed me to draw trends across cases for further theory refinement. That is, the three researched contexts with a studied phenomenon of TE analysed via a blending approach provided a holistic perspective on the qualitative nature of the research questions in this study. The observations of patterns in themes comparing school stakeholders' perceptions in this study yielded nuanced and actionable insights of affected key outcome variable. Table 27 facilitates the comprehension of the research contexts- Hungary, Kazakhstan, and Poland- and their routes to outcomes of TE in OLEs and the roles of families and teachers in supporting SL.

Table 27 List of Antecedent, Mediating, and Outcomes Variables

Antecedent variables	Mediating variables	Outcome variables
*Domain I (Planning and Preparation) (DC) 1.Demonstrating Knowledge of content and Pedagogy (= PK, CK) 2.Demonstrating Knowledge of Students (= PCK) 3.Setting Instructional Outcomes (*TP; CP) 4. Demonstrating Knowledge of Resources 5.Designing Coherent Instruction (=PCK; TP) 6. Designing Student Assessments (=PCK; CP; TP)	Teacher variables: *Age (generational gap) *Years of experience Subject taught Knowledge of students User skill Technology acceptance (IC) School support (IC) Training and development (IC) Student variables	Change in TE Change in SL Digital governance Family-school collaboration Teacher Professional Development

	User skill
*Domain II (The Classroom Environment)	Type of school
1.Creating an Environment of Respect and Rapport	Use of EdTech before the pandemic (IC)
	*Designated place for learning at home
2.Establishing a Culture for Learning (*SP)	
3.Managing Classroom Procedures (=PK)	Family variables
4.Managing Student Behavior (SP)	*SES
5. Organising Virtual Space	*Demographic variables (educational attainment, occupation, urban or rural setting)
*TK, TPK, TCK, TPACK	*User skill
*Digital Divide	*Technology acceptance
	*Availability of technologies for learning

Note: *DC= Deductive Coding; IC Iinductive Coding; TP= Teaching Presence; CP= Cognitive Presence; SP= Social Presence; PK= Pedagogical Knowledge; CK= Content Knowledge; TK= Technological Knowledge; TPK= Technological Pedagogical Knowledge; TCK= Technological Content Knowledge; TPACK= Technological Pedagogical and Content Knowledge; TE= Teacher Effectiveness; SL= Student Learning.

This table illustrates a relation between teacher effectiveness and student learning with mediating variables. According to the interview and remote lesson observation data in this study, teacher-participants from all three researched contexts had a strong command of antecedent variables. That is, components of Domain I Planning and Preparation and Domain II The Classroom Environment were in place. Linking this evidence to the organisation of teacher education in three researched contexts, it is essential to ensure antecedent variables are in place in other contexts as well.

4.5.1 Similarities

Three research contexts allowed for comparison and identifying a set of similarities in teacher variables. Participants in this study named teacher variables such as age, years of experience, subject taught, and user skill were identified across three case studies as important antecedent variables in identifying TE in successful use of technology in teaching and learning. The distribution of participants per country was the following: nine out of twelve participants in Hungary and in Kazakhstan, and all eight participants in Poland. Table 28 summarises participants' perceptions and interaction with the phenomenon under question in diverse educational contexts supported by study qualitative data.

Table 28 Participants' quotes related to key teacher variables affecting their teaching online

Country	Participant	Quote
Hungary	EdTech expert 2	'If you are a teacher in a small school with… less than 200 students and you have to learn something new you don't want to change for a while. Because mostly the teachers in those regions are older than the average. And the average teacher's age in Hungary is old already. Sometimes teachers are already retired and they are coming back in those areas to teach. So if you win the fight with them to learn something new, then they have to change again, it's not the solution'
Kazakhstan	EdTech expert 1	'We tracked learning analytics in our LMS and noticed that teachers before 30 years old scored higher in student engagement, student participation, and the range of EdTech used during a lesson. We did not observe the same results in senior teachers'
Poland	Family 1	'Typing quickly or reacting to some changes might be difficult. And this is the case, especially for the older generations. We still have good teachers, very good teachers who are over 50 or 60s… when they connect with the younger generations who are pretty fluent and very experienced with technologies, somehow they lose credibility'.

By creating this table, I was able to distinguish another commonality in the interview data with all participants. Table 29 shows descriptive data from first-cycle coding across all research contexts ordered according to the main variables being examined, i.e., TE and SL.

Table 29 Descriptive Table: Teacher Effectiveness and Student Learning during remote teaching (participants' quotes reflecting educational context and widening disparities among families): extracted quotes

Country Participant's quotes	Similarities
Hungary	'I cannot create an equal and balanced language classroom, for example, if the students have different levels of technology available to them' (Teacher 2)

	‘There's a very big gap right now, between small villages and towns. And it's a huge problem right now in education… small villages need to use as many digital assets as possible because the resources are finite. (EdTech expert 1).
Kazakhstan	‘There are low-income families where parents cannot provide for students. Many schools provided computers and laptops to such families… a lot of money was spent on this from the state budget, but the effectiveness of this child’s learning … is not clear. ….a lot of work needs to be done here’ (Family 1)
	‘We noticed that we have bright teachers and average teachers. This year teachers had a salary rise. Now during remote education, teachers teach via WhatsApp, report on their teaching and they’re done. They are not teaching…We see this in many regions, especially in the countryside and also in the city. This is a depressing situation about the quality of teaching. …many of our teachers are ordinary people with low attitudes towards their profession’ (EdTech expert 1)
Poland	‘Being a teacher in Poland is problematic for many reasons, okay. It's a job, which is not well respected from a society perspective. They are underpaid. Also, the teachers in private schools… the entire system is wrong. You cannot pay a teacher so little, but those jobs are difficult and underpaid. They talk about fixing this, but it never gets fixed. (Family 1)
	‘My perception is that if people become teachers, it's because they want to become teachers, because they love people, they love to spend time with them. They love to teach’. (Family3)

4.5.2 Differences

The three research contexts allowed for comparison at different levels. First, I analysed an individual as a unit of analysis. Second, I compared teachers’ instructions observed during remote lessons in Hungary and Kazakhstan. I refrained from comparing students’ qualitative interview data in the case of Poland because of the unequal distribution of participants across contexts. Third, I re-read analysed coded data and identified themes to generate a more comprehensive understanding of the participants’ views of the researched topic.

To begin with, there were noticeable differences in demographic variables between the teacher samples across three countries. First, it is noteworthy that solely a cohort of language

teachers from Kazakhstan consisted of early-career teachers (M=4, years of experience) and an average age of 32 years old. As for educational background, it is worth noting that Hungarian language teachers possessed educational degrees spanning from a bachelor's to a Ph.D.

Similarly, there were differences in the family sample. Both the Hungarian and Polish families possessed Master's degrees in various disciplines whereas the Kazakhstani parents had Bachelor's degrees. Family 3, Hungary and Family 3, Poland were the only participants with one child. Additionally, Family 3, Hungary was a single-parent family.

While all children-participants studied in public schools, there were differences in school governance and administration. Children in family 1, Hungary, family 1 and 3, Poland attended public schools semi-governed by non-governmental organisations or professional attachments to religious associations in their respective countries. Student-participants from Kazakhstan attended public schools.

Next, in relation to the teachers' remote language lesson observations that I attended as a non-participant, there were a few observable differences. I provided a brief comparison in the table below. A sample of detailed observation reports for a Hungarian teacher and a Kazakhstani teacher is provided in Appendix N.

Table 30 Brief overview of observed lessons during the pandemic in Hungary and in Kazakhstan

Teacher Nr and Country	Online learning environment	Summary of strengths of the observed lesson	Summary of teacher challenges

Hungary, Teacher 1	Lesson was held via Google Classroom. Grade 11. Eight students were present. Language level taught: strong B2	Teacher demonstrated a strong command of pedagogy and content. Teacher announced lesson aim, lesson stages and aims for each stage, and an expected outcome. Teacher provided learners with different media resources including a textbook in .pdf format, with several links for formative assessment in vocabulary and listening. Teacher worded the instructions clearly, scaffolded learning by modelling task completion, announced time limits for different lesson activities and provided timely feedback.	Given the occasional Internet connectivity issues, students did not turn on their cameras to save bandwidth. Thus, it was challenging for the teacher to establish rapport and a supportive climate in the online lesson. The teacher experienced challenges with integrating technology for a more effective teaching. These insufficiencies in teacher's TPK and lack of establishing supportive social presence might have resulted in low student engagement, student to student interaction, and low task achievement. There were potentially other external variables which the teacher could not control given the remote and pandemic nature of online learning.
Kazakhstan, Teacher 4*	Lesson was held via Zoom. Grade 8. 12 students. Language level taught: A2-B1	Teacher established a friendly rapport with your class at the beginning of the lesson by asking how they spent the previous day. Teacher displayed a class presentation with short clear instructions and screenshots of the source of the task and the task itself. Students followed the task completion in their physical textbooks at their desks. Signposting: teacher announced the lesson aim to students. Teacher used gamification (Kahoot!) as the main summative assessment method.	Although instructions were displayed on the presentation, the teacher repeated them a few times. It was difficult to assess if students needed it or if instructions on the presentation slide were sufficient enough. Selection of class activities did not lead to practising higher cognitive skills. The activities were oriented at the low-thinking skills according to Bloom's taxonomy (e.g., remembering). Content language was weak. Teacher made a few grammatical mistakes and did not address one of the student's tasks.

Note: *= this teacher participated only in remote lesson observations in this research

4.5.3 Summary of key qualitative findings

In order to respect page limitations, I display the summary of major qualitative findings in table . The findings address each of the research questions 3, 4, and 5. Next, I discuss the findings of the mixed-methods study. In accordance with the design of the study, I applied analytical approaches suitable for the convergent parallel study.

Table 31 Summary of Key Qualitative Findings answering the research questions 3-5

Qualitative Research Question Nr	Key qualitative findings
1 Pedagogical use of EdTech in teaching and learning as perceived by study participants	Contributing factors of EdTech in teaching and learning: ● contributing to the development of teacher's knowledge of pedagogy and content integrated with the use of technology ● creating more opportunities for inclusive education ● contributing to the development of students' digital skills, soft skills, self-regulation ● EdTech as an opportunity for inclusive education ● opportunity for teacher professional development (?) Limitations of EdTech in teaching and learning ● lack of the variety of language methodologies ● governance by the Big Tech ● missing human interactions
2 Perceptions of teachers, families, and students about their shift from traditional learning environment to OLEs	● Teachers' perceptions: Emotional rollercoaster ● Students' perceptions: ' I was doing nothing the whole year' Families' perceptions: ● Family as an educational provider ● Family as a learner ● Outlier
3 Types of challenges that teachers faced in an abrupt switch to ERE	● Digital Divide ● Teacher-knowledge specific challenges - TPACK constructs - Lack of CoI in online learning ● Curriculum-specific challenges ● Learner-specific challenges
Similarities between researched contexts	● Identifying teacher variables across three researched contexts as important antecedent variables in contributing to the theory refinement of TE in OLEs. ● Observing relationships between macrosystem variables such as educational context and widening disparities among families as based on the participants' responses
Differences between research contexts	● Unequal distribution of participants. ● Poland is excluded from the comparison because of the absence of remote lesson observations. Based on the teacher interviews and remote lesson observations from Hungary and Kazakhstan online teacher instructions were compared based on the FfT form, see Appendix N.

4.6 Findings of the integration of mixed methods

This section reports on visual joint display interactions and final integrated meta-joint display model. In this section I report on two types of mixed methods analysis procedures described in section 3.6.3. First, I merged quantitative results and qualitative findings presented above via a joint display (Fetter et al., 2013). Followed by a data comparison to illustrate convergence and divergence, the merge of data summarises the results of this mixed method convergent parallel study. Second, I conducted a merged analysis (Creswell & Plano Clark, 2011) to contribute to the development of the theoretical framework of TE in OLEs focusing on SL.

Mixed methods research: To what extent, if any, did the combination of survey research, in-depth interviews and classroom observations provide a more comprehensive understanding of teachers' roles in supporting students' learning and maximising teacher effectiveness in Hungary, Kazakhstan, and Poland?

The following joint display (Figure 13) is constructed on the foundation of the theoretical framework used in this study and depicted by nested circles. At the heart of the display is the TPACK (Mishra & Koehler, 2006) model specifying Foreign Languages (English) discipline examined in this study. The TPACK Model is surrounded by the scales from the CoI questionnaire (Garrison et al., 2000) in light green. The light red circle on the outside of the CoI model represents the elements of the Domain I Planning and Preparation and Domain II The Classroom Environment from the Framework for Teaching (Danielson, 2013). Lastly, the outward transparent circle with dotted line indicates an external layer of influence on teaching and learning occurring in OLEs. It includes elements of the contextual factors in the macrosystem such as the socio-economic conditions in the society, cultural and social capital of the society, digital divide, educational context, and teacher variables.

The display proposes a methodological approach to view TE in OLEs. It recognises the validity of existing frameworks (CoI, Garrison et al., 2000; Digital Divide. van Dijk, 2000; TPACK, Mishra & Koehler, 2006; FfT, Danielson, 2013). Hence, the elements of TPACK, CoI, and FfT serve as constants for each aspect of the pedagogy, content, and technology in the foundation of a proposed model of TE in OLEs. The display also illustrates emerging needs of school stakeholders- teachers, families, and students- to plan teaching and learning in the

environments requiring emergence remote instructional support involving educational shutdowns. Thus, the variables in the outward transparent circle serve as means to maximise TE and support SL with technologies. The constants and variables are shared by all teachers and students applying TE model in OLEs. They are critical in planning to carry out teaching and learning with available resources remotely.

In creating the display my intention was to balance the visual presentation of the results and consider colour coordination (Miller & Bustamante, 2016) to communicate the value of each theoretical proposition. Therefore, I did not include the themes and corresponding quotes in the model to ensure reader-friendliness (Haynes- Brown & Fetters, 2021) of the model (see *Figure 22).* The analytic intent was to triangulate the results identified from quantitative and qualitative strands of data, and to assess the extent of the data concordance between two strands of data results. Figure 13 depicts relationships among the quantitative results and qualitative findings of this study. The following sections of pedagogy, content, and technology integration interpret the mixed methods results of this study depicted in the joint display.

Pedagogy

The qualitative data reported a major shift in teachers', students', families', and EdTech experts' views in the areas of teaching practices online and its pedagogical value for learning. Specifically, how EdTech enables language teachers to foster student engagement, to strengthen their knowledge of pedagogy and content, and effectively consider knowledge of resources and students in developing their instructional practices for OLEs. The teachers realised the importance of careful lesson planning and preparation reflecting on the knowledge of technology affordances and barriers at both ends, at teacher's and students' sides. Furthermore, teachers questioned the lack of flexibility of textbook-based curricula which lacked the contribution to SL in OLEs during ERE.

The qualitative data of teachers' and students' interview responses also illustrated an interplay between Domains I and II in the FfT, elements of CoI, and TPACK constructs. Participants' responses and observational data demonstrated students lacking a holistic learning experience with carefully planned and implemented elements of instructional design, facilitation

(TP), timely feedback, open communication, and group cohesion (SP), integration and resolution (CP).

Based on these qualitative findings, the quantitative results on TPACK and CoI scales are not surprising. Teachers' self-reported perceptions on TPACK score indicated significant differences in the type of school as discussed above in section 4.2.1. Students' perceptions of CoI illustrated CP could be instrumental in enhancing TP and SP, according to the CoI student self-reported results. In this study, however, students and parents reported in their interviews about the lack of teachers' timely feedback and regular communication on the progress of students' learning. These participants also noted a repetitive use of Power Point presentations and use of classroom-based practices in OLEs. Students did not experience learning advancing their higher-order thinking skills, according to students' and parents' interviews.

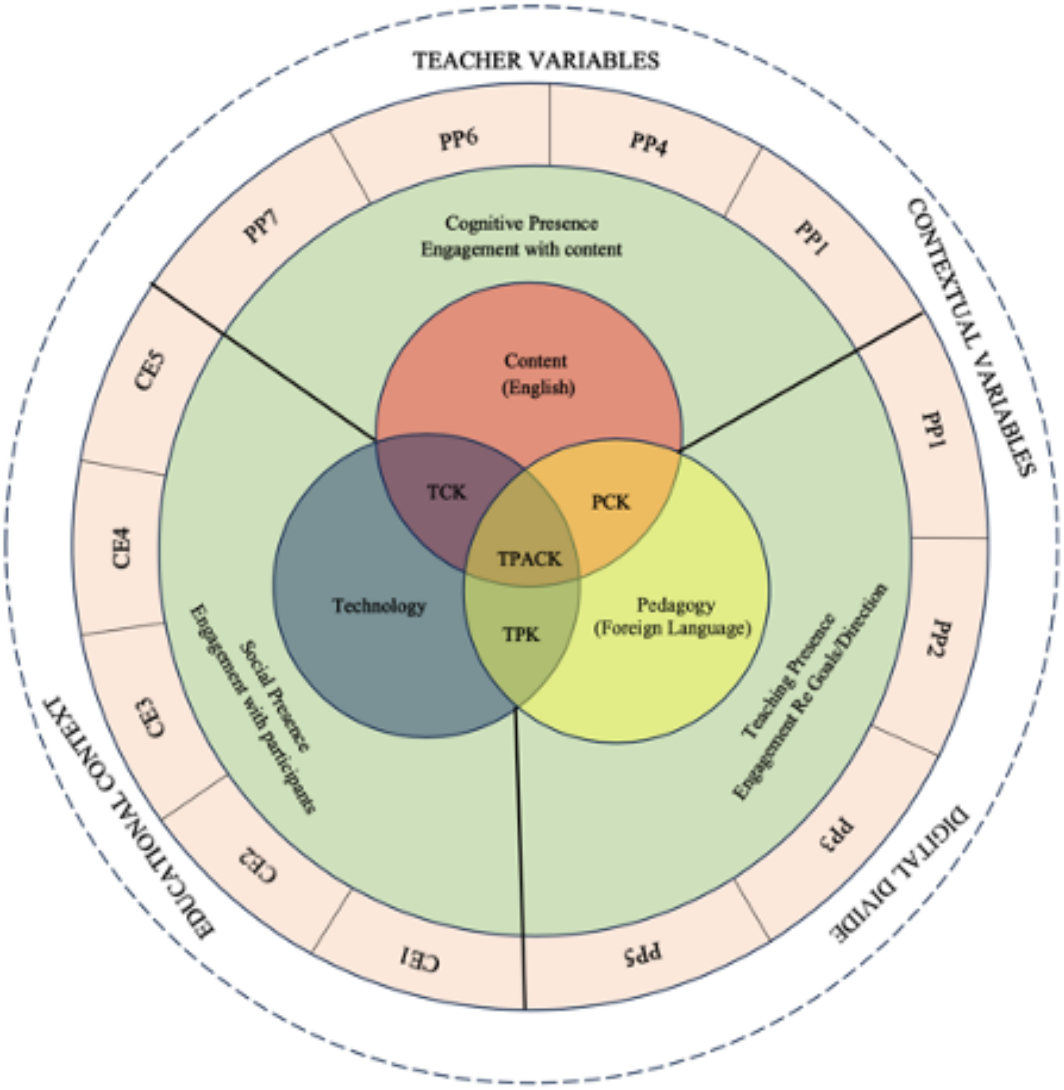
Notwithstanding these qualitative and quantitative results discussed above, it is noteworthy to consider the contextual variables such as family and child(ren)'s SES, family educational and occupational backgrounds, the digital divide, and educational contexts of participants that affected teachers' practices in OLEs. As interview responses from teachers and EdTech experts showed, level 1 of the digital divide crucially affected teachers' abilities to

deliver language lessons. Therefore, this large variation in technology and connectivity access among teachers, evident in qualitative data and not controlled by teachers, affected their technology integration practices in OLEs. Consequently, it can be concluded that the qualitative findings and quantitative results regarding TPACK scores and CoI student self-reported results are partially congruent, indicating an area of further exploration in future research. Importantly to note, adopting multilevel analyses in comparing examined educational phenomena was crucial for the balanced and holistic understanding and achieving the aims of this study. As Alexander (2001, p. 51) posited,

> [P]edagogy does not begin and end in the classroom. It can be comprehended only once one locates practice within the concentric circles of local and national, and of classroom, school, system and state, and only if one steers constantly back and forth between these, exploring the way that what teachers and students do in classrooms both reflects and enacts the values of the wider society.

In other words, the author of this dissertation aimed to differentiatite the universal language pedagogy "from the culturally specific" (Alexander, 2001,p. 511).

Figure 12 Joint display of Teacher Effectiveness in Online Learning Environment



Note: PP1= Demonstrating Knowledge of Content and Pedagogy; PP2= Demonstrating Knowledge of Students; PP3=Setting Instructional Outcomes; PP4=Demonstrating Knowledge of Resources; PP5=Designing Coherent Instruction; PP6=Designing Student Assessments; PP7= Demonstrating Knowledge of Technology Affordances for Content Integration; CE1=Creating an Environment of Respect and Rapport; CE2=Establishing a Culture for Learning; CE3=Managing Online Learning Environment Procedures; CE4= Designing Safe and Accessible Learning; CE5= Organizing Virtual Space. Teacher variables include demographic variables such as teacher's age, years of

experience, type of school, and urban/ rural setting. Contextual variables and Educational Context include national curriculum standards, school policies on K-12 digitalisation, technical equipment available at schools, and educational reforms. The Digital Divide includes consideration of the three levels of the Divide in designing online learning environments and teacher development.

Content

The qualitative findings indicated teachers striving towards using authentic materials such as video clips from British Council, creating digital flashcards in Quizlet. Teachers used some of these materials before the pandemic and in their responses acknowledged high quality, ease of use, ease of searching for, and preparing these materials for their online lessons. To support these findings, CK was assessed in the TPACK questionnaire indicating a mean value of 4.17 among language teachers across countries.

Although not all teachers were able to interact with students, as opposed to interactions happening in classroom-based lessons, these materials were appreciated by teachers. Similarly, students have noted the use of visually appealing digital materials meeting their age needs and interests. Students also noted difficulties in using digital flashcards and lengthy video clips from YouTube or other sources because of the connectivity issues. However, based on remote lesson observations conducted with one Hungarian and two teachers from Kazakhstan, there was some discrepancy between what teachers said in interviews and what was observed. In the observed lessons there was a lack of authentic materials appealing to student learning and accessed with ease. Both observations and interviews with teachers were conducted in the first months of the pandemic. Therefore, it might be concluded that qualitative findings are partially congruent, which indicates an area of further research.

Technology

Quantitative results of TK was on average 4.34 out of 5 indicating a moderately strong technology proficiency. This mean value of TK score among language teachers across case studies can be supported by teachers' qualitative data. Overall, teachers demonstrated a positive attitude towards using technologies in language teaching and learning. For instance, teachers stressed in interviews how technologies facilitate their teaching practices in creating authentic and engaging experiences in OLEs. However, teachers' perceptions about the pedagogical value of using

technologies in language teaching and learning remotely did not occur without challenges. Most of the challenges were discussed in section 4.5. Coping with these challenges, teachers emphasised the crucial role of acknowledging contextual factors such as the digital divide, educational context, family and students' educational and socio-economic backgrounds *in* lesson planning and preparation. Teachers' TK was also observed during remote lessons to some extent. Specifically, it was evident how teachers planned learning activities that did not require a strong Internet bandwidth and use of online learning platforms requiring prior installation on students' gadgets.

Technology integration

Quantitative results of the TPACK-21 indicated a mean value of technology integration with pedagogy and content among the sample of language teachers in this study of 4.09. Findings from the qualitative data demonstrated that teachers were effective in their technology integration practices to a lesser degree. That is, based on remote lesson observations and interview responses from both teachers and students it was evident that teachers used EdTech at a functional level. Overall, teachers integrated the use of PowerPoint presentations or collaborative learning tools such as Google Docs or Google Forms for practising writing or assessment. Nevertheless, teachers expressed what hindered them the most with technology integration in pedagogy and content. Namely, insufficient knowledge of technology integration with pedagogy occurred due to the lack of school support and professional development on technology integration with language pedagogy and content, the digital divide, lack of flexibility of the subject curriculum and learning assessment oriented at students' test scores. Students, families, and EdTech experts also noted in their interviews variations in teachers' age, taught subject, type of school, and rural residence as critical factors in explaining teachers' poor technology integration practices with pedagogy. The qualitative insights provided by students, families, and EdTech experts find support in the TPACK scores concerning teacher demographic variables. Hence, it can be concluded that the qualitative and quantitative results regarding technology integration are partially congruent, indicating an area for further research.

4.7 Summary of Findings

A merged data analysis comparison via a joint display illustrated data convergence and data divergence between the qualitative and quantitative results. With regards to TPACK-21

scales, the results of the questionnaire indicated that teachers in Kazakhstan and Poland had the lowest scores in PK (M=3.93; M=4.05 respectively). Further analysis revealed that TPACK-21 scores were significantly different between the age groups of 31-40 (M=3.97) and 41-50 (M=4.50) across research contexts. The highest average score in the age group 31-40 teachers across case studies showed in TK (M=4.43), their peers in the 41-50 age group scored the highest in TCK, M=4.66. Teachers' mean value of TPK between the age groups of 31-40 and 41-50 was M=4.04 and M=4.11 respectively across case studies. The observational data results confirmed teachers' good knowledge of TK in the language teaching and learning domain in the 31-40 age group. Yet, the observational data illustrated that teachers in this age group 31-40 used technologies mainly for drill and practice purposes such as sharing Powerpoint presentations, sharing web links to watch videos and conduct student self-assessment. Interview findings with this age group confirmed the observational data findings. For instance, teachers aged 31-40 explicitly spoke in our interviews about using third-party applications such as Kahoot!, Quizlet, Word Wall in their online lessons via sharing web links or displaying e-textbooks in Zoom or MS Teams platforms. However, exploring qualitative data closer I noticed the explanatory aspects of the central phenomenon, i.e., teachers' technology integration with pedagogy in OLEs for the teachers aged 51-60. Overall mean value of the TPACK-21 scores of teachers in this age group was M=3.68 with the lowest scale of TPK, M=3.37 and TK, M=3.55. The interview findings with families, students, and EdTech experts confirm generational gaps in the extent of using technologies in language teaching and learning. All participants including teachers across case studies spoke about the demanding need for teachers aged 51-60 to increase their TK, TPK, TCK, and overall TPACK. However, all study participants have recognised that teachers, regardless of their age, have been untrained or poorly trained to meet the demands of remote teaching. Specifically, families and EdTech experts referred to two major reasons for teachers' unpreparedness to effectively conduct the remote teaching and learning. First, it was the lack of adequate national strategies in the digitalisation of secondary education. Second, the lack of provision of technical support and equipment for teachers created financial challenges for some teachers in this study sample. There was a third reason, although not a universal theme for all participants, indicating teachers' lack of skills to translate their classroom-based teaching to OLEs. This theme was mainly observed in the

analysis of interviews with a few EdTech experts (1 and 2, Hungary; 1, Kazakhstan; 1, Poland) and some families (1 and 3, Hungary; 1, Kazakhstan; 1, 2, and 3 Poland). Merging data in the domain of pedagogy illustrates that there was a discrepancy between the quantitative and qualitative results. Although differences were reflected in teachers' age group, qualitative findings of the study were able to explain this data discrepancy. Furthermore, quantitative data indicated that there is a significant difference between secondary schools and other schools. This data could not be compared to the qualitative findings because the study participants represented either primary school or secondary schools.

Regarding technology, all study participants recognised that teachers and schools were not prepared for massive ERE. Although TK mean value across case studies was 4.35, the participants cited challenging factors that affected ERE implementation. These included the three levels of the digital divide, the lack of national strategies of the K-12 digitalisation supporting schools and teachers for professional digital skills training and technical support, teacher shortage and generational gaps in teacher population across case studies, and growing educational inequalities due to socio-economic disparities.

Overall, the study findings about technology integration illustrated partial congruence between quantitative and qualitative results. While a mean value of TPACK across research contexts was 4.19 in this study sample of participants, qualitative data mainly demonstrated language teachers' use of technologies for drill and practice, a use of classroom-based teaching practices in OLEs, and teachers' attempt to adapt their knowledge and skills to teach online. Teachers' intentions towards professional development on online pedagogy skills was mainly present in interviews with participants aged 31-40 across researched contexts.

In the second, integrative phase of analysis, I presented meta-inferences juxtaposed with quantitative and qualitative results as an overall interpretation of the findings across the researched contexts. I also presented a revisited view on theorisation of TE in OLEs supporting SL integrating the distinct findings of this mixed methods convergent parallel multiple case study. In doing so, I aimed to illustrate the experiences of this study participants to online learning environments that can be used to infer about implications for practice and policy for school stakeholders.

This study adds to the areas of teacher knowledge, technology integration, teacher professional development, and technology-enabled (foreign) language learning by emphasising the foundational constants and shifting variables as central in maximising TE and supporting SL facilitated via EdTech. The constants include elements of pedagogy, content (foreign languages), and technology; the variables include elements of the digital divide, educational contexts, contextual, and teacher variables. Building on prior scholarship (discussed in chapter 2), the current study provides substantive evidence that the theoretical references used in this study, when used independently from each other, do not embrace the intricacies of teaching and learning in OLEs aiming to support SL. Indeed, the mixed methods findings of this study suggest that the theoretical references used in this study, as currently conceived on their own, lack explicitness in technology integration in teaching practices in OLEs that are crucial to support SL. In the following chapter, I discuss the implications of the main findings of this study in the domains of technology-enabled language teaching and learning. I also explain how a proposed model of TE in OLEs can be applied in teacher education and teacher professional development broadly.

4.8 Chapter summary

This chapter contains the results of the quantitative and qualitative analysis. The analysis of CoI questionnaire (n= 153) indicated K-12 students' need for social presence and teaching presence which may lead to robust perception of cognitive presence. TPACK score results (n=93) illustrated strong and partially strong results across research contexts. The results of this study suggest that variations in TPACK scores were influenced by teachers' types of school they work at. At the same time, teachers' age, educational level and years of teaching experience did not have a statistically significant impact on TPACK scores. Teachers working in secondary schools demonstrated higher TPACK scores in comparison to those in other types of institutions. The qualitative findings were based on the interview analysis of the thirty-one participants and twenty-three remote language lessons delivered by two teachers in Hungary and Kazakhstan. The four themes resulting from the qualitative findings summarise the contributing factors of antecedent and mediating variables in TE to provide support to SL in OLEs. Themes included categories of data reflecting initial Domains I and II Planning and Preparation and the Classroom Environment from the FfT (Danielson, 2013) with an expanded view on OLEs. Furthermore, mediating

variables of teachers' and students' knowledge of technology affordances and barriers, contextual variables at teacher level, student level, and family level need to be considered in examining TE in OLEs. The elaborated framework on TE needs to be adapted to the opportunities and constraints of OLEs to effectively support SL in remote, i.e., online learning.

The chapter connects the analysis back to the research questions and demonstrates consistency of the analysis with mixed methods convergent parallel study taking a comparative educational perspective. Consistent with mixed methods methodology, there were several levels of analysis. Data analysis included the cyclical process of coding (Saldaña, 2016), thematic analysis (Braun & Clarke, 2006), descriptive and inferential statistics, merged analysis, and data integration illustrated in the joint display. Analytical approaches applied in the mixed methods analysis allowed me to examine the quantitative and qualitative findings in different ways. The merged analysis compared the databases for data congruence or divergence, and beyond. It informed the study about the evidence behind the numerical TPACK questionnaire results. Remarkably, the qualitative findings across research contexts provided textual and observational data of teachers' technology integration practices at a basic level, e.g., showing a PowerPoint presentation for drills and practice. The integrative case analysis via the joint display illustrated congruences and discrepancies between qualitative and quantitative databases. Teachers' knowledge reported in the TPACK-21 questionnaire was in partial agreement with the qualitative findings. The TPACK-21 scales did not mention contextual variables such as educational contexts, teachers' SES, teachers' digital literacy skills, teachers' technology acceptance levels, and the impact of the digital divide on teachers' technology integration practices in OLEs discovered in interviews with participants across the research contexts. Furthermore, the qualitative data demonstrated teachers' practices to design online learning for K-12 students with a strong focus on instructional outcomes following the curriculum requirements, preparing high-school students for final exams, and translating classroom-based practices to OLEs. The quantitative evidence from the CoI questionnaire indicates the crucial importance of establishing social and teaching presence for robust cognitive presence as self-reported by K-12 students from Hungary, Kazakhstan, and Poland.

The use of meta-inferences in this mixed method convergent parallel design was to interpret the findings across the research contexts overall. This study contributes to expanding the theorisation of TE by integrating and visualising the distinct findings in a proposed model of TE in OLEs supporting SL. The model (see Figure 13) is grounded in the experiences of diverse participants from three research contexts- Hungary, Kazakhstan, and Poland- with a range of ethnic, educational, linguistic, socio-economic, and age differences. The model is designed for (language) teachers to instruct in OLEs or in times of crisis demanding the shutdowns of educational institutions.

Chapter 5 Discussion of Findings and Conclusion

This chapter reports on the study conducted in Hungary, Kazakhstan, and Poland during unprecedented times of the COVID-19 global pandemic. The purpose of this mixed methods convergent parallel study was to explore teacher effectiveness in online learning environments. Also, the study aimed to advance our understanding of the roles of families in supporting student learning facilitated by educational technologies in times of crisis. This chapter includes a discussion of major findings as related to the literature on teacher effectiveness in planning and preparation and classroom environment, technology integration in language learning, design of online learning environments for K-12 students, and parental support in technology use for educational purposes at home. Additionally, it includes a discussion on theorisation of teacher effectiveness in online learning environments. Reflecting on the study, I further discuss implications that may be valuable for use by policy makers, teachers, industry professionals, and K-12 students who use technologies in language learning. Concluding, the chapter ends with a discussion of the study limitations and areas for future research.

The following research questions guided this mixed methods convergent parallel study:

RQ1: What are foreign language schoolteachers' strong and weak TPACK-21? (Technological Pedagogical and Content Knowledge)

RQ2: What is the relationship among social presence, teaching presence, and cognitive presence of the Community of Inquiry as reported by school students?

RQ3: What are school stakeholders' (secondary school foreign language teachers, students, parents, and educational technology experts) perceptions on the pedagogical use of technology in remote, i.e., online learning?

RQ4: How do school students, teachers, and families live through the shift in traditional boundaries in learning environments?

RQ5: What challenges did teachers experience in switching to an emergent remote teaching and learning?

Mixed methods research: To what extent, if any, did the combination of survey research, in-depth interviews and classroom observations provide a more comprehensive understanding of teachers'

and families' roles in supporting students' learning and maximising teacher effectiveness in Hungary, Kazakhstan, and Poland?

5.1 Summary of the Study

This study emphasises a holistic approach to TE recognising a changing role of families and the impact of the forms of families' capitals (social, educational, financial), educational contexts, and the digital divide. First, the results of this mixed methods convergent parallel study can inform the development of inclusive EdTech solutions for teaching and learning and assist teacher-practitioners in improving their instructional practices. Second, by adopting a mixed methods and comparative approach in educational studies, I was able to construct different interpretations of the phenomena. The study conducted in Hungary, Kazakhstan, and Poland with diverse profiles of the participants offered new evidence about issues pertaining to teaching and learning via technology use, and new interpretations of parental involvement to SL during a crisis such as the COVID-19 pandemic. Families and teachers described their transitions between the traditional and the disruptive educational experiences using a language of emotions. As a result, this work contributed to the understanding of resilience and change in teaching remotely through a lense of emotions.

This study offers a more comprehensive framing of what many teachers are already doing-teaching online- being much more attuned to the local and specific layers in educational, socio-economic, and cultural capitals of school stakeholders. This framework draws its inspiration from several sources including broad theoretical work of Bourdieu (1978) on social and financial capital and Ecological Systems Theory by Bronfrenbrenner (1976), studies on parental involvement and academic expectations, and distance learning in K-12. That is, these theoretical references signal the impact of socio-economic backgrounds of both students and teachers on the effectiveness of online instructions in language teaching and learning. This framework underscores the importance of teaching effectively online with a strong focus on building a supportive online learning community with and among learners. Additionally, teachers' digital competence and knowledge about technology integration with pedagogy are central to the framework. This chapter further discusses significant implications for theory, methodology, research and practice in K-12 online

education, and the EdTech industry. This dissertation ends with study limitations and avenues for future research.

Considering the diverse educational landscapes of Hungary, Kazakhstan, and Poland, there were unique challenges and successes that each country experienced in adapting to remote education during the COVID-19 pandemic. As a result, some of them discussed below impacted the overall findings of the study. First, all three countries shared significant challenges in the areas of inequity and inequality of digital access among all educational stakeholders, i.e., families and children, teachers and schools. Centralised curriculum, i.e., educational systems in all three research contexts are governed by central government educational body that did not immediately respond to challenges associated with the content and teacher preparedness to teach remotely during the COVID-19 pandemic. Followed by lack of ongoing teacher professional development on upgrading teachers' digital literacy, three countries demonstrated to an extent a less proactive response to supporting educational stakeholders in continuing schooling during the COVID-19 pandemic from homes. On the other hand, Hungary, Kazakhstan, and Poland demonstrated different approach to supporting schools, teachers, and students by providing e-platforms and learning management systems to ensure schooling asynchronously. For instance, Kazakhstan has introduced various learning management systems and web-platforms before March 2020 whereas Hungary and Poland utilised Google Classroom and support from Microsoft company on connecting students and teachers during the pandemic.

In sum, these and other measures discussed in Section 2.4 have mitigated the challenges between all educational stakeholders involved in providing remote education in Hungary, Kazakhstan, and Poland during the COVID-19 pandemic. While all three countries faced common challenges such as digital inequality and teacher preparedness, their responses were shaped by their specific contexts. Kazakhstan had to address infrastructure gaps, Hungary leveraged television for educational broadcasting, and Poland focused on integrating widely used online platforms and supporting teachers with professional development. Therefore, these contextual characteristics were considered in discussing the results of this study from the perspective of the digital divide, teacher education focusing on digital literacy preparation, and wider societal context as seen from the Ecological Systems Theory (Bronfenrenner, 1979) perspective used in this study.

5.2 Interpretation of the Results and Findings

While TE includes variation of antecedent and mediating variables (see Table 34) for each participant, each of the five common themes (see Chapter 4) were prominent factors in refining a model of TE for OLEs in this study. These factors, including both contributing and limiting factors of EdTech in teaching and learning, reflect dispositions of Domains I and II of the FfT (Danielson, 2013) important for this study sample.

5.2.1 Overview of the refined model of TE for OLEs

This study was framed in the social constructivist paradigm of learning assuming that knowledge is constructed as a result of individual learning through reflections and interactions between individuals and their environments. Combining multiple theories referring to the value which teachers add to students' learning, this study involved the complex interplay of students' SES, parents' forms of social and financial capital, accessibility and availability of educational technologies, and larger online learning settings. The findings presented in Chapter 4 provide illustrations, which reveal what teachers in the early and later phases of their professional lives as well as families, K-12 students, and EdTech experts perceived as key components of TE in OLEs. In particular, the study sample observed some similar aspects of TE as described in the domains of Planning and Preparation and The Classroom Environment (Danielson, 2013). The Matrix for TE in OLEs (see Table 18 below) complements Domains I and II of the FfT (Danielson, 2013) with the findings derived in this study. Based on the findings of this study, the cell where an aspect of TE intersects with expanded Domains I and II from FfT (referring to section 2.2.1), Planning and Preparation and the Classroom Environment respectively, explains how TE can be implemented in that component of the domain. Domain II the Classroom Environment is renamed as Online Learning Environment to meet the needs of the educational phenomena under question. For example, as shown in Table 32 TE can be achieved through Planning and Preparation involving EdTech by integrating technology for language pedagogy needs in the Demonstrating Knowledge of Content and Pedagogy component in Domain I. The Matrix visualised in Table 32 emphasises that effective TI depends on pedagogy and specific content (foreign languages). TI can be achieved when teachers invest in their professional development including receiving institutional support, and strengthen their TPACK to create student-oriented online learning environments and lessons.

More specifically, the Matrix stresses on the social nature of learning encouraging teachers use specific strategies to establish and support social presence and teaching presence to create high-level learning in an interactive online setting (Parrish et al., 2021; Shea et al., 2010).

Table 32 Matrix for teacher effectiveness in online learning environments

Dimensions of Teacher Effectiveness / Aspects of Teaching	Planning and Preparation involving EdTech	Online Learning Environment	Inclusivity as a value-added component of TE via EdTech
Pedagogy	Demonstrating Knowledge of Content and Pedagogy via integrating technology for language pedagogy needs	Design and creation of effective online learning applying evidence-based knowledge of the elements of teaching presence (e.g., scaffolding strategies, student-teacher interactions)	Creating an equitable learning environment to engage students and encourage learning
Curriculum planning and design	Knowledge of content-related pedagogy	Digital learning content encouraging the development of the 21st century skills (critical thinking, problem-solving, communication skills, reflective skills, independent inquiry)	Digital learning content equitably designed, accessed, and delivered
Content	Demonstrating Knowledge of resources for students' online use extending teachers' technological pedagogical and content knowledge	Setting expectations for learning and achievement involving the development of digital skills (levels 2 and 3 of the digital divide)	Designing content aiming at higher cognitive thinking skills involving accessible and available use of content-oriented EdTech
Knowledge of students	Demonstrating Knowledge of students and their needs in online learning environments	Knowledge of students' technology affordances for learning (level 1 of the digital divide)	Learning materials and assessment strategies accessible to all students
Student support	Lesson planning and preparation using EdTech for collaborative online	Creating a socially present environment focused on establishing and maintaining social interactions online	Supporting a culture of learning: promoting student autonomy and peer learning
Teacher professional development	New quality in teaching and learning	Ongoing efforts on the development and implementation of a digital competence framework for teachers to support teaching and learning and increase system resilience in case of future crisis	Opportunities to improve the quality of teaching catering to teachers with different TPACK
Organising virtual space for learning	Reducing the distance between students and instructors by establishing a community of inquiry	Importance of student to teacher and student to student interactions built in a subject/ course design	Respect for students, safety and accessibility

5.3 Discussion of the Quantitative Results

5.3.1 TPACK results

According to the descriptive results of this mixed methods study language teachers in Poland perceived themselves with having higher TPACK scores (M=4.41, SD=.280) in comparison to Hungary and Kazakhstan (see Table 8). Furthermore, non-parametric Kruskal-Wallis H test illustrated that language teachers' type of school differed significantly between participants across research contexts. Specifically, teachers working in kindergartens appeared to have the highest mean rank of TPACK value in comparison to teachers from high schools.

English language teachers from Hungary and Poland showed their confidence in mastering subject content with technology (TCK) with mean values of 4.77 and 4.73 respectively. In comparison, English teachers from Kazakhstan and Poland scored similarly in knowing how to use technology (TK) with mean values of 4.43 and 4.41 respectively. English teachers from Kazakhstan and Poland scored lower in pedagogical knowledge (PK) (M=3.93, SD= 1.05 and PK: M=4.05, SD= 1.36 respectively) and implementing instructional strategies to teach subject content (PCK) (M=4.13; SD=1.04 for Kazakhstan and M=4.27; SD=1.25 for Poland) compared to the teachers from Hungary (PK: M=4.50, SD=.97; PCK: M=4.58; SD=1.04). Similar to the findings of a study (Cheng, 2017) on exploring EFL teachers' TPACK, these results suggest that English teachers in Kazakhstan and Poland are in need of enriching their competence of PK and PCK; English teachers from Hungary will benefit in strengthening their TK. Equally, the enhancement of knowledge on applying instructional approaches via the use of technology is necessary for English teachers from all three countries.

Teachers with 4-9 years of teaching experience had higher TPACK, TK and TPK than teachers with 20+ years of experience. From these results it can be inferred that more experienced teachers lack the necessary technological knowledge than their less experienced peers. However, teachers with 4-9 years of teaching experience showed lower PK, M=3.98, which indicated that less experienced teachers are less equipped to apply pedagogical approaches.

When controlling for age, teachers with 4-9 years of teaching experience possessed a higher TPACK score, M=3.97 whereas teachers with 20+ years of experience demonstrated a mean value of TPACK= 3.68. Similarly, teachers with 4-9 years of teaching experience demonstrated

stronger TK and TPK in comparison with teachers with 20+ years of experience. Finally, it can be concluded that teachers' age contributed to lower TPACK scores.

Prior studies that have noted the importance of age and years of teaching experience that may have played a role in language teachers' TPACK scores, especially among in-service teachers (Cheng, 2017). However, in Cheng's (2017) study gender was an additional demographic characteristic in understanding in-service Hakka native language teachers' TPACK in Taiwan. Results of this study, similarly to Cheng's (2017), imply that blending technology, specific content, and pedagogy brings potential to older teachers in enhancing their effectiveness in OLEs.

5.3.2 Community of Inquiry

Garrison and colleagues' (2000) seminal work introduces three types of presences necessary to account for when designing online learning. The Community of Inquiry (CoI) framework emphasises a creation of meaningful learning environments through the development and interaction of three presences- teaching presence, cognitive presence, and social presence. The CoI framework serves as a process framework, i.e., it informs about how learning takes place in online environments and does not talk about the learning outcomes (Zehra et al., 2009).

The relationship of three presences indicates that they are significant for student perceived learning and satisfaction in online courses (Caskurlu et al., 2020; Akyol & Garrison, 2008). Studies employing the CoI framework demonstrated student connections and interactions, engagement with course instructors (or teachers) in collaborative learning activities, and students' self-reported perceptions on gaining deeper levels of community to support their individual learning (Bamoallem & Altarteer, 2022; Szeto, 2015). In this study, the relationships among the three presences were examined. The quantitative results of this study aligned with Garrison et al. (2010) seminal work and Parrish et al. (2021) findings illustrating that teaching and social presences have a significant perceived influence on cognitive presence.

In answering research question 2, this study illustrated a moderate positive relationship between social presence and teaching presence. In line with Martin et al.'s (2022) meta-analysis, this study highlighted students' needs, aged 10-18, in establishing supportive learning environments to engage with online learning. As the CoI results of this study indicated, the correlation between the social and teaching presence was rather small (r=.27) across research

contexts. However, these basic elements of social and teaching presence are not sufficient enough to support SL remotely, i.e., online.

Furthermore, this study confirms that getting informal and timely feedback, clarifications, and explanations about what was required in home assignments (elements of teaching presence) is associated with students' experiences of cognitive presence. Although there was a small positive relationship between cognitive presence and teaching presence as well as cognitive presence and social presence, these results reflect those of Pratt and Lai (2023). Pratt and Lai (2023) CoI survey results indicated that K-12 students experienced online learning positively in terms of cognitive and teaching presence, but their experience of social presence was different. High school students lacked timely feedback, peer interactions, and a sense of belonging in an online community. This is a finding found in interviews with this study participants that should be further explored in more depth.

5.4 Discussion of the Qualitative Findings

Educational technology scholars have supported the combination of technology and pedagogy in various content areas insisting on a necessity of having a specific framework (-s). Among these frameworks are theoretical references of this study, namely Framework for Teaching (Danielson, 2013), TPACK, a teachers' guide for true technology integration (Mishra & Koehler, 2006), CoI (Garrison et al., 2000) grounded in social constructivist learning design, and the digital divide explaining what factors prevent access to learning via digital tools. Furthermore, theories illustrating an importance of considering environmental conditions (Bronfrenbrenner, 1976) for learning and how social, cultural, and educational capitals mediate learning opportunities for students participate in the interpretation of the qualitative findings of this study in accordance with the constructed themes.

5.4.1 Theme 1 & 2: Contributing factors and Limitations of EdTech in teaching and learning

The third research question concerned study participants' perceptions about the pedagogical value of EdTech for teaching and learning. Data analysis revealed that participants, language teachers, families, K-12 students, and EdTech experts' perceptions referred to two overarching areas: contributing and limiting factors of EdTech for teaching and learning in pedagogy, content, and technology integration. Therefore, the author of this dissertation combined

first two themes to provide a macro-view on the pedagogical value of EdTech for teaching and learning based on the evidence in this study.

Pedagogy

This study set out with the aim of expanding a framework of TE meeting the needs of OLEs and supporting SL. To begin with, this study found overall agreement between participants' perceptions of the pedagogical value of EdTech for teaching and learning and the scientific conceptualisation offered in the literature. First, throughout the interviews the participants emphasised the pedagogical value of EdTech in different domains of TE, for example as referring to teacher professional development and EdTech as an opportunity for inclusivity. These findings suggest that participants in the present study are aware of the variety of the pedagogical value of EdTech in teaching and learning. The participants in this study differentiated the domains of TE identified in the literature recognising the components of Domain I from the FfT such as teachers' knowledge of pedagogy, knowledge of students and resources (Danielson, 2013).

Furthermore, some teacher-participants realised that traditional approaches to lesson planning and delivery, typical for brick-and-mortar schools, neither yielded anticipated results nor maintained teachers' teaching goals. This realisation led some teachers to implement elements of flipped classroom pedagogy to enhance students' language production skills. Among experienced advantages of the flipped classrooms teachers mentioned teacher- and student- oriented benefits. For instance, students' collaboration, interaction with the content, more time for practising language production skills. Recent study evaluating active learning techniques and technology use in flipped classrooms noted advanced learning and peer collaboration for deeper conceptual learning (Taghizade et al., 2023).

Similarly, teacher-participants in this study have also recognised important advantages for themselves. When exchanging learning materials designed for ERE context via teacher marketplaces, some participants reflected on the amount of time they were able to save in lesson preparation. Using digital tools for communication with other teachers via the Internet led some teacher-participants expand their technological knowledge and implement new digitally driven assessment practices. As a result, students showed more learner engagement emotionally and behaviourally interacting with the subject content and with the teacher. Past studies evaluating

student engagement determined three types of engagement: behavioural, cognitive, and affective (Bond, 2020; Fredricks, 2004).

Content

Study participants in this study have been able to provide an in-depth account of EdTech meeting subject content needs. First, remote observational data illuminated key elements of functional use of technology in language teaching identified in the literature, i.e., for drill and practice purpose. In a study with EFL teachers such technologies as Power Point, Padlet, QR, Kahoot! and other were used for skill-, rule-, and function-based practices (Ding et al., 2019). Similarly to Ding and colleagues (2019), teachers in this study demonstrated content-specific TI practices to engage students, to interact with them, and to support their verbal instructions with visual, audio or game material.

Next, some teachers have stressed on the lack of flexibility in subject curriculum and lack of appropriate digital learning content catering for all learners' needs. At the same time, teachers recognised their limited knowledge of integrating technology in teaching. Other participants (families, students, and EdTech experts) have echoed teacher views. Specifically, some EdTech experts and family members expressed disappointment about teachers' unpreparedness to adapt to online pedagogy. Teachers' unpreparedness to involve EdTech in their teaching can be explained by the lack of teacher training and development, lack of or absence of school support, and teachers' attitudes about the use of technology for learning. These are some of the findings previously written about in the literature (Cheng & Xie, 2018; IAC, 2021; Magyarország Digitális Oktatási Stratégiája, 2016; Tarkowski & Plebańska, 2019). Furthermore, as it was discussed in the literature review, national policies of Hungary, Kazakhstan, and Poland have not focused on teacher preparation for online teaching before March 2020, i.e., at the outbreak of the COVID-19 pandemic. In line with the participants' interviews, one of the most important findings was a lack of the pedagogical support to teachers during ERE for various language methodologies. Based on teachers' comments, it is necessary to recognise that many of them acknowledged their attempts to provide online learning experiences. However, they found difficulties finding time and appropriate English language content accessible to the majority of their students, especially children from disadvantaged families or extended families experiencing level 1 of the digital

divide. This finding broadly supports the work of other studies (e.g., Semjén et al., 2018) in this area linking contextual factors such as students' educational history and inequality in student performances, lack of access to the digital and financial resources, and its impact on teachers' professionalisation (Kozhabayeva & Boivin, 2022; Tomczyk & Walker, 2021).

Technology Integration

Study participants' views on technology integration differed. EdTech experts and families in their interviews recognised teachers' transfer of classroom-based instructional practices to synchronous lessons during ERE (Bao, 2020; Bolliger et al., 2019; Erickson & Wattiaux, 2022; Turk et al., 2021; Zulu, 2022). In contrast, teachers explained their decision to use familiar instructions widely practiced in traditional classrooms. Teachers' curricular needs, lack of appropriate digital learning content, and dynamic changes in the classroom required teachers to solve immediate technical issues related to ERE. As mentioned in the literature review (Kopcha et al., 2020), teachers enact instructional practices involving technology use based on their perceptions of what is possible. Understanding why and when teachers blend teacher-centred and student-centred teaching practices is widely discussed in the literature (Chen & Xie, 2018; Vongkulluksn et al., 2018). Often, teachers' decisions on TI in their teaching is context-dependent.

Another observed practice of language teachers in integrating technology based on their perceptions in this study can be explained by the participants' limited technological pedagogical and content knowledge. The emphasis on pre- and in-service teachers' training and development of technological knowledge for educational purposes has been documented by many scholars, including Hungarian (Homoki & Nyitrai, 2022; Öveges & Csizér, 2018), Kazakhstani (Bokayev et al., 2021; Hajar & Manan, 2022a), and Polish authors (Jakubowski & Sitko-Dominik, 2021; Plebańska, 2017).

5.4.2 Theme 3: Emotional roller-coaster

One unanticipated finding was a language of emotions that the participants used to describe their shift from traditional learning to emergent remote learning. Since the global pandemic appeared, there were studies exploring the role of schools in students' social emotional learning

and parents' mental health in coping with children's learning from home because of the COVID-19 pandemic (Davis et al., 2021; Kim et al., 2021).

What is curious about this finding is that emotions were overlooked in the majority of interviews with teachers and EdTech experts. The emotions that some teachers used to describe their coping strategies with the ERE implementation reflected their fears and lack of confidence in teaching online and building online interactions with their students and parents. The emotions that students used reflected their loss of learning opportunities, loss of time, decreasing confidence and motivation to continue learning in less familiar (i.e., online) settings. The emotions used by parents signalled about their disappointment in teachers' skills to be flexible and adapt to changes.

This finding suggests that in remediating the current deficiencies exacerbated by the pandemic the social nature of learning shall be addressed broader in schools and by teachers (Kim et al, 2021). Integrating elements of social emotional learning in teachers' planning and preparation fits the CoI and addresses missing social interactions (section 4.3.1 in Chapter 4). Showing some affective expressions, being curious about how students find online learning in comparison to school classrooms and building upon these conversations can be helpful to some students (elements of social presence).

5.4.3 Theme 4: Changing Roles of Families

The role of families in supporting SL during home-based learning because of the global pandemic was another central focus of this study. Overall, all interviewed families across case studies unanimously agreed their roles have shifted from traditional caretakers to adjusting their parenting role to the new social reality (Nielsen, 2020; Bronfenbrenner, 1979). This major finding is in line with existing studies (Balenzano et al., 2020) discussing how some families were able to rediscover their family relationships despite the challenges of the pandemic, using the greater amount of time to rediscover the value of being at home together at times of crisis (Cluver et al., 2020).

Another important finding of this study points out to the necessity of providing pedagogical support to parents. The sample of parents in this study clearly indicated challenges they have faced in becoming educational providers to their children lacking substantial and adequate pedagogical

and subject matter expertise. The study sample of families possessed digital skills and digital gadgets for learning, and financial means to provide a good quality of home-based learning. Yet there was a gap between accessibility and availability of digital learning resources remotely and guidance how to use these resources at home. Without school and teacher support in continuing schooling from home parents felt at loss and children lacked cognitive, physical, and social aspects of learning to some extent. Previous study (Kim et al., 2021) observed similar findings in their study although their focus was on play-based activities during ERE.

The findings on changing roles of families in supporting SL are even more troubling for low-income families (Bourdieu, 1986) or whose backgrounds limit their children's access and availability to digital means of learning and content. Considering the rising digital inequalities parents need to collaborate with schools to ensure equitable learning environment to children and increase parental involvement going beyond fundraising and communication activities (Ma et al., 2014).

5.4.4 Theme 5: Types of teacher's challenges in implementing emergent remote education

The final theme of this study refers to teachers' challenges in implementing ERE. With regards to the difference in teachers' demographic characteristics found in the quantitative TPACK-21 results, qualitative findings pointed to the similarities of teachers' responses across research contexts. First and foremost, language teachers across research contexts recognised a lack or absence of competencies in one or several TPACK factors. In other words, teachers with 4-9 years of teaching experience and with 20+ years of language teaching experience commented on their low command of technological knowledge or confidence in blending instructional approaches and subject content with available technological tools. The results of this study agree with the literature from Hungarian, Kazakhstani, and Polish scholars regarding the importance of enriching teachers' technological knowledge (Courtney et al., 2023; European Commission, 2020; Fekete, 2022; Madalinska-Michalak, 2017).

Furthermore, similarly to studies of Roig-Vila et al. (2015) and Cheng and Xie (2018), a more experienced and elder sample of teachers in this study in their interviews referred as being less enthusiastic about using Internet and EdTech for instructional purposes in online teaching. Their low attitude can partially be explained by their firm confidence of pedagogical knowledge

and low self-efficacy of technological knowledge (Cheng & Xie, 2018; Hsu et al., 2017; Kazu & Erten, 2014). However, as Saudelli and Ciampa (2016) showed, experienced teachers scored low in TK and possessed more enthusiasm to incorporate technology into their instruction than less experienced teachers did. This area needs further investigation with a larger sample of English language teachers with different age groups.

Finally, a more troubling finding of this study adds the challenges of the digital divide to teachers' lack of integrating technology with pedagogy. This study has qualitatively found that teachers' SES background affects their effectiveness and limits their abilities to support SL in OLEs. The majority of teachers have repeatedly commented that schools did not provide them with infrastructure to conduct remote teaching during the pandemic. Some parents across research contexts have also stressed how their language teachers lacked technical and professional support from schools or other educational authorities to organise and carry out remote education. In previous literature (Pratt & Lai, 2023) one of the solutions to this internal barrier was found in creating school networks to navigate teachers in distance education and share learning materials. Other studies (Durff & Carter, 2019) have also pointed out to the benefit of teacher collaboration equipping teachers with digital literacy skills and exposure to TI for student-oriented learning environment. Perhaps this area of school culture of embracing changes and innovation needs further investigation, especially when schools and teachers navigate through times of uncertainties and crisis.

5.5 Surprising findings

Governance by the Big Tech.

Remarkably, the research revealed participants' views and concerns on technological 'colonisation' of education. Previous literature (Decuypere et al., 2021; Decuypere, 2019a; Decuypere, 2019b; Gorwa, 2019) has widely explored and conceptualised EdTech integration in schools prior to the COVID-19 pandemic. This study adds to the knowledge-base of the digital education tools enacted by the private companies such as Apple, Facebook, Microsoft, Google to name a few. More specifically, the analysis of parents' interviews revealed their concerns about swift digitalisation by the Big Tech fostering an emergence of blended school governance (Landri, 2021). EdTech experts in their interviews have further explained how datafication and

platformisation of education (Landri, 2021) transform education. While digitalisation of education was seen as *the* solution during the COVID-19 pandemic, some scholars question to what extent digital colonisation undermines teacher agency and weakens public regulations of schooling (Day et al., 2022).

5.6 Discussion of the Mixed Methods: Use of Joint Display

5.6.1 Key insights developed in the form of a joint display

The results of mixed method research expand our current knowledge of TE in light of FfT (Danielson, 2013) because the conditions of the emergent remote education during the pandemic revealed some areas of knowledge creation in studied domains of the Danielson's (2013) Framework. Study participants stressed the importance of learning about students' resources for online learning at home including environmental conditions such as availability and access to technologies for learning. Quite often, as the participants noted, these conditions were not met in families with low SES that naturally created barriers to support SL in home-based conditions. Equally, these barriers recognised in the literature as first- and second-order barriers (Ertmer, 1999) to teacher TI practices, have affected TE among the sample of this study participants. That is, teachers who did not own laptops for teaching, had no access to strong Internet or a strong command of technological pedagogical and content knowledge felt limited to prepare and teach student-oriented lessons with the help of technologies. Importantly, the quantitative results suggested statistically significant differences between teachers' TPACK scores related to teachers' type of school they worked at. These results partially converge when integrated in mixed methods because the study sample of participants contrasted participants' interview quotes from primary and secondary schools in the qualitative data phase.

The analysis of interviews with teachers revealed the motivational nuances indicating that both primary and secondary school language teachers viewed teaching using EdTech as an additional tool to attract students' attention via a game, for instance. At the same time, secondary school teachers have also pointed out to a lack of flexibility of school curricula and English subject curriculum when the subject is taught primarily in online environment. According to some teacher-participants, the existing and available EdTech do not match the requirements of the current school curricula in research contexts; hence an expansion of capabilities of government-provided

platforms or the platforms by the Big Tech need to be in order to increase system resilience for future times of crisis. The teacher- participants felt resistant to adapt to new online learning environments, adapt and integrate their pedagogy including learning materials. Their resistance, as data analysis revealed, can be explained by several important factors: (1) curriculum primarily linked to textbooks lacking digital content and means through which the digital content is accessed and learning is facilitated, (2) lack of school support and technical support to assist teachers in integrating technology to pedagogy and subject content, and to some degree (3) teachers' age and years of experience. Participants' interviews showed that teachers with 4-9 years of experience were more open towards learning about technologies including technologies in their teaching to engage students and maintain their interest. In contrast, teachers with 20+ years of teaching experience possessed a strong knowledge of students, resources to learn from and with, skills to vary methodology and strengthen SL involving a simple use of technologies. Understandably, more experienced teachers had a higher score of the pedagogical knowledge across research contexts in comparison with teachers of 4-9 years of experience. Remote lesson observational data further supported these results (see table 20).

These results can be further explained in the dimensions of teaching presence, cognitive presence, and social presence as self-reported by K-12 students. According to the quantitative results of CoI questionnaire, there was a moderate positive linear relationship between cognitive presence and teaching presence and between cognitive presence and social presence. This relationship indicated that an increase in cognitive presence results in moderate increase in teaching presence and social presence. In other words, when teachers plan and prepare student-oriented lessons focusing on growth in learning (cognitive presence), students observe stronger teaching and social presence. Data analysis of K-12 students revealed that regular teacher-to-student communication, timely feedback on students' assignments and beyond, approaches to learning, affective expression and formative assessment, approaches to group cohesion, and peer learning are important factors for strengthening the student online learning experience. These results confirm previous research on self-directed and social nature of online learning among undergraduate students conducted by scholars in the past in different contexts (Arbaugh, 2008;Lim, 2023). As such, these students can benefit from effective teaching presence activities,

i.e., instructional design, direct facilitation, and instruction (Caskurlu, 2020). Furthermore, the qualitative findings of this study explained the quantitative results. Specifically, students in their interviews reported about basic elements of communication and online instruction that they observed in online lessons during the pandemic. These included real-time chats in WhatsApp groups with and without a teacher, in Facebook Messenger and Google Classroom to inquire

Table 33 Brief overview of observed lessons during the pandemic in Hungary and in Kazakhstan

Teacher Nr and Country	Online learning environment	Summary of strengths of the observed lesson	Summary of teacher challenges
Hungary, Teacher 1	Lesson was held via Google Classroom. Grade 11. Eight students were present. Language level taught: strong B2	Teacher demonstrated a strong command of pedagogy and content. Teacher announced lesson aim, lesson stages and aims for each stage, and an expected outcome. Teacher provided learners with different media resources including a textbook in .pdf format, with several links for formative assessment in vocabulary and listening. Teacher worded the instructions clearly, scaffolded learning by modelling task completion, announced time limits for different lesson activities and provided timely feedback.	Given the occasional Internet connectivity issues, students did not turn on their cameras to save bandwidth. Thus, it was challenging for the teacher to establish rapport and a supportive climate in the online lesson. The teacher experienced challenges with integrating technology for a more effective teaching. These insufficiencies in teacher's TPK and lack of establishing supportive social presence might have resulted in low student engagement, student to student interaction, and low task achievement. There were potentially other external variables which the teacher could not control given the remote and pandemic nature of online learning.

Teacher Nr and Country	Online learning environment	Summary of strengths of the observed lesson	Summary of teacher challenges
Kazakhstan, Teacher 4*	Lesson was held via Zoom. Grade 8. 12 students. Language level taught: A2-B1	Teacher established a friendly rapport with your class at the beginning of the lesson by asking how they spent the previous day. Teacher displayed a class presentation with short clear instructions and screenshots of the source of the task and the task itself. Students followed the task completion in their physical textbooks at their desks. Signposting: teacher announced the lesson aim to students. Teacher used gamification (Kahoot!) as the main summative assessment method.	Although instructions were displayed on the presentation, the teacher repeated them a few times. It was difficult to assess if students needed it or if instructions on the presentation slide were sufficient enough. Selection of class activities did not lead to practising higher cognitive skills. The activities were oriented at the low-thinking skills according to Bloom's taxonomy (e.g., remembering). Content language was weak. Teacher made a few grammatical mistakes and did not address one of the student's tasks.

about home assignments and receive web links for various educational purposes, using LMS to host lesson plans, to display electronic versions of language textbooks and lesson content. The meta-inferences of mixed methods in this study juxtaposed quantitative and qualitative findings

and provided an illustration of the combined use of the TP, CP, and SP with other theories to design online learning oriented at supporting SL in OLEs.

Furthermore, use of the joint display as an analytical tool helped organise quantitative results and qualitative findings including local contexts that were considered across countries. That is, participants in each context referred to issues in education systems such as teacher shortage (Csizér, 2019; Wilson et al., 2013; Wisniewski & Zahorska, 2020), inclusion of technological knowledge component in teacher professional development (European Commission, 2019b), coherent technology-assisted curriculum, lack of culture promoting changes, and innovation in teaching and learning delivered and accessed via technologies (Durff & Carter, 2019).

5.6.2 Significant Original Contribution to the Knowledge and Implications

The study offers new insights into teacher effectiveness and parental involvement in student learning in situations of crisis that involve the shutdown of educational institutions. The study highlighted the potential and crucial importance of using technologies in home-based learning instructed by teachers with strong knowledge of technology integration with pedagogy and content. This type of teaching and learning cannot be fully achieved without teachers' knowledge of students' SES and family backgrounds, availability of the Internet connection, and accessibility to owning and using a technology for learning. This new knowledge and theory enhancement is illustrated in Figure 13 to communicate the significant original contribution to the knowledge of this doctoral study.

Using the FfT (Danielson, 2013), TPACK (Mishra & Koehler, 2006), the CoI (Garrison et al., 2000), and the Digital Divide (van Dijk, 2000) frameworks as theoretical references for the design of this study proved to be useful. These frameworks also contributed to the co-construction of understanding and interpreting the study participants' experiences of technology use and integration in foreign language teaching and learning in critical situations such as the pandemic COVID-19. These frameworks have also provided a more complete picture of the ways families and language teachers support students in their learning facilitated via EdTech. The theories I used served as tools in knowledge building. Therefore, an important theoretical contribution of this study is that expanding the potential of existing frameworks on the kinds of teacher knowledge

and effectiveness, and the knowledge of parental involvement in SL can create meaningful teaching and learning experiences in OLEs.

Importantly, the study contributes to the field of school improvement, teacher quality studies, and techno-social-economic research by suggesting that language teacher effectiveness in online learning environments should be distinguished from the culturally specific component. Hence, language teacher effectiveness in online learning environments shall be viewed as universal focusing on the types of teacher knowledge (e.g., TPACK) and value kinds of presences in online learning environments (e.g., teaching presence, social presence, and cognitive presence) within given contextual characteristics.

This study makes a noteworthy contribution to the mixed methods methodological literature in three ways. First, by differentiating the joint displays of parallel data collection from joint display of mixed methods findings and joint display analysis. Second, the dissertation distinguishes the joint displays in planning and implementing the mixed methods study, and in representing the mixed methods data visualisation. Third, the dissertation illustrates variations of communicating study results through tables, figures, matrices, and diagrams.

5.6.3 Methodological implications

This study provides several methodological values to the extant literature on integration of mixed method research findings. First, connection with previous theories and what they mean for this doctoral study. By adopting a mixed methods approach I was able to seek holistic understanding of participants' perceptions and experiences of online teaching and learning during the COVID-19. Second, convergent parallel design contributed to investigating this complex study from two methodological perspectives, i.e., quantitative and qualitative (Creswell & Plano Clark, 2018) that yielded further clarification in understanding the phenomena under the question. The mix of quantitative and qualitative research methods provided advantages and risks of each methodological decision in data collection, analysis, integration and interpretation in answering research questions. That is, the iterative nature of data analysis in mixed methods via joint displays signals a reader about challenges that might be encountered in constructing joint displays, planning a study, and implementing it. With regards to adhering to ethical considerations, it is imperative to ensure high quality in conducting studies online. Given the online nature of data collection, a

critical eye throughout the study is essential to compensate for the limitations of online means in preventing fraudulent responses or in detecting duplications. Third, comparative research methods with special regard to the historical factor has further distinguished the design of this study. Fourth, the joint display assisted to show inconsistencies in an iterative research cycle between quantitative and qualitative data.

Additionally, the use of mixed methods as a primary design of this study encouraged a synthesis of quantitative and qualitative approaches in the design, collection, analysis, and dissemination of the present research study. The methodology of this study offered innovative empirical insight into families and relationships with EdTech at home for learning and beyond followed by practical suggestions for designing pedagogical and digital education support to parents. Equally, the applied methodology in this study compared the numeric results with constructed themes and offered a holistic framework of studying TE in OLEs with regard to contextual characteristics in a given setting. That is, the proposed framework presented in a form of the joint display (Figure 13), as a product of this research, points to consider the levels of the digital divide, the educational - , teacher - , and contextual variables such as subject domain, types of schools, types of teachers' knowledge, and the extent of school support in supporting teaching and learning involving EdTech use. The foundation of the proposed framework is the existing Framework for Teaching (Danielson, 2013) that highlights context-bound parameters pivotal for teaching and learning online.

5.6.4 Educational implications

The study explored the role of families and teachers in supporting SL situated in the context of the COVID-19 pandemic. Therefore, the findings of this study have important practical implications for teachers, policy makers, and parents wishing to integrate technology for educational purposes at home and in schools. Educational implications for school leaders and policymakers, teachers, and families are detailed in this order. First, the study recommends schools and policies to provide equitable access to technology and Internet connection among different teacher and student populations. Second, policymakers could tailor professional development programs to teachers' needs based on the results of this study. Third, policymakers and teachers should address the digital divide in adapting assessment strategies. Fourth, schools and policy

makers can support families by raising awareness of the ways digital education can be offered at home and by equipping families with pedagogical assistance when needed.

In reference to the first point, this study contributes to the pedagogical implications by providing insights into teacher practices of combining technology with pedagogy in OLEs following the national standards of educational systems. The findings can inform curriculum developers, policymakers, schools, educational communities, ICT coordinators, and teachers in designing and revising curriculum frameworks and educational policies that support and foster technology integration skills among (language) teachers. For example, creating a space for digital transformation by implementing a digital education plan in schools. The digital education plan must meet school needs and goals in ICT transformation in teaching and learning with regards to the school's existing and future capacity in infrastructure and other resources (e.g., time, budget, human resources) (Sosa-Diaz et al., 2022; OECD, 2023).

In reference to the second point, this research showed that providing teachers with school support such as technical infrastructure, professional training on developing technological knowledge and technological pedagogical knowledge helps teachers with changing their attitudes about technology use in teaching. This study showed evidence that K-12 students aged 10-18 value human interactions in their technology-facilitated learning, especially as the stakes of schooling get higher. A carefully designed lesson instructing and facilitating student learning with a space for sufficient social presence (e.g., open communication, group cohesion) contributes to stronger cognitive presence (Garrison et al., 2010; Parrish et al., 2021). For instance, teachers should try to create a learning atmosphere in OLEs that allows students to 1) safely express statements of agreement and disagreement, 2) affirm students that online spaces develop a sense of online collaboration, 3) challenge students' perspectives, 4) work independently and in groups, and 6) co-construct knowledge. Some of these strategies may signal student-orientedness in teachers' practices, beliefs, and technology attitudes.

In reference to the third point, knowing about students' resources and technology affordances is needed for both primary and secondary learners to design equitable and equal assessment for learners. Knowing that K-12 students see and use technology as a source of learning anytime anywhere, teachers should tailor their assignments to promote higher order thinking skills

in digital formats via digital content. In turn, curriculum flexibility should be prioritised as an opportunity to be inclusive in providing digital learning content to teachers and learners of diverse backgrounds, especially those who have no means to access and possess digital means for learning. Policy makers and most importantly teachers need to be included in the curriculum development reflecting teaching needs and learners' needs for the realities of post-COVID era in teaching and learning. Furthermore, in reference to preventing digital colonisation teachers need to be involved in selecting tools for learning that present pedagogical value to students and teachers (Csonka-Stambekova, 2023). This could be achieved by EdTech or the Big Tech by, for example, designing digital tools with the inclusion of current knowledge base from educational sciences on the notion of learning.

In reference to the fourth point, the interviews with families across research contexts shed light on the experiences of families and their approaches in supporting student learning during home-based learning because of the pandemic. Schools and teachers can learn from these experiences and adapt strategies for supporting SL in non-educational settings. This can include parental digital educational programs to help prepare families and students for potential shifts to virtual instruction (Marshall et al., 2020; Monks et al., 2016; Tejedor & Pulido, 2012). These kinds of programs will also equip school stakeholders-schools, teachers, students, and families-to be ready for emergency school closures due to weather, natural disasters, sickness, or other emergencies. Additionally, teachers should be provided with systematic professional development on the most suitable practices of effective remote, i.e., online instruction (Durff & Carter, 2019; Li et al., 2019). This should include the specifics of a context schools and teachers operate in to prepare for future school closures due to emergencies.

5.6.5 Theoretical implications

This study has theoretical implications. To begin with, this work addressed why Domains I and II, Planning and Preparation and The Classroom Environment (Danielson, 2013) in the FfT are insufficient for the post-COVID era in teaching and learning (Morris-Mathews et al., 2020).In addition to supporting Morris-Mathews and colleagues' (2020) conclusions on why domains in FfT are not sustainable, the results of this dissertation claim to expand the current Framework for Teaching (Danielson, 2013). First, at the time of writing this dissertation in 2023, the Framework

has not been updated after the pandemic. To remind the reader, Domains I and II, Planning and Preparation and The Classroom Environment (Danielson, 2013) have been developed based on the theoretical and empirical studies in the Western contexts a decade ago, that is, the evaluation metrics were designed for traditional classroom teaching and learning. These domains lack the knowledgebase of how K-12 students learn online, types of teachers' TPACK knowledge, and elaboration of building online learning communities via the interaction of teaching presence, cognitive presence, and social presence. Furthermore, as it was stated in section 2.2.1, there was a paucity of qualitative evidence employing the FfT (Danielson, 2013). The present study contributed to bridging this gap by synthesising 17 remote lesson observations and interviews with teachers. As a result, this study illustrated why Framework for Teaching needs to be redefined in order to reflect the multiple parameters of examining teaching and learning online.

Second, a novel approach of combining validated theoretical frameworks of teaching, integration of technology with pedagogy, and online learning is important. This approach configures the relationships between ideas of teaching and learning, and relationships between a teacher, a student, and a technology in certain contexts. These theories together added value to the raw data of the study and 'deviated from the conventional habitual way of representing reality" (Lodge, 1992). Specifically, the results of this study transformed the framework of TE by shedding light on students' and teachers' voices on teaching and learning in OLEs in context of the digital divide.

Third, based on exploration of rich field data, the emergent theoretical framework of this study argues to marry the CoI and the TPACK frameworks for an in-depth understanding of TE in OLEs. These frameworks target common constructs in teaching and learning via technologies but are not configured together. My framework ties the CoI and TPACK models within the FfT and is especially relevant for contexts experiencing a crisis oriented towards continuing a provision of education. Broadly, an emergent theoretical framework of this study adds that TE in OLEs is strongly influenced by local contextual factors and teachers' perceptions of their ability to teach effectively using EdTech. Thus, the extent of whether teachers in this study perceived themselves effective in teaching together with a technology will also likely to be associated with the extent of their contexts.

Fourth, the theoretical propositions used in this study justify the selection of mixed methods design to achieve the broader aims of the study across three research contexts comparatively. Furthermore, the use of existing frameworks can configure the limitations of generalisations in already existing knowledge.

Fifth, being theoretically driven, this research may influence policy research and address questions of equity in providing online education oriented at continuing learning for students across different backgrounds. Policymakers are encouraged to make informed decisions in alignment with the evolving landscape of education including the datafication and platformisation (Landri, 2021) of education.

5.6.6 Implications for policy makers

This study offers at least three implications for policymakers. This study has partially identified problems with the implementation of the Big Tech governance concerned with the access to children's data collected through schools as public bodies which is already a concern on its own. In the absence of subject matter experts who can audit the EdTech products' transparency and educational benefits, this study concludes with recommendations for governments and policy makers to respect children's digital and educational rights and to support schools' and families' capacity in determining what is best for their students.

First, a law body should be included in a digital education school policy with the audit power to exercise a systematic approach to children's data processing and protection. The body should collaborate with EdTech providers and school administration, develop and inform the involved school stakeholders on the digital hygiene and digital protection regulations.

Second, policy makers should collaborate with EdTech providers to bridge the equity gap in providing quality education accessible and affordable to many students at their fingertips regardless of students' SES and geography. Creating technological products aligned with effective teaching methodologies requires firsthand professionals who possess a deep understanding of pedagogy and are able to interpret student data to promote learning. This study demonstrated that EdTech companies can involve teachers and educators to deliver student-oriented learning.

Third, EdTech solutions offered locally by governments and educational authorities need to ensure effective channels of communication between teachers, students, and families. That is,

schools using EdTech in teaching and learning should aim to align their technological solutions with the best interests for teachers, students, and their families. In turn, this can create trust in technology used for learning as evidenced in the required adjustments to Google G Suite for education in the Netherlands (Nas & Floor, 2021).

5.6.7 Limitations

The study was delimited to English school teachers from public secondary and high schools, school students aged 10 and above who had to teach and study English from home because of COVID-19. The study was also delimited to participants who owned devices to participate in online interviews, in remote online English classroom observations and who could take two questionnaires in English from either a mobile phone or a personal computer. The limitations of the research are subject to what the participants agree to report and publish. At the time of data collection, the majority of the countries worldwide were on lockdown, thus the travel and social participation was prohibited or limited. When trying to find participants for the study, I was able to locate them only from urban settings with strong and stable Internet connection and bandwidth for video conferencing. The participants, especially the families and the school students were from exemplary families who were able to give interviews in either Russian or English fluently and who had some experience in online learning prior to COVID-19 outbreak.

There were a number of restrictions that I took note of during and after the study was completed. In the design of this study, I experienced time limitations, budget constraints, linguistic peculiarities of the study instrumentation, constraints in resources to conduct the study, inability to travel to research venue sites because of health measures related to coronavirus COVID-19. Thus, the design study was necessary given the three different geographical locations with different official languages. To examine and explore the complex phenomenon of this study a fully integrated mixed methods research design would be necessary. For example, the inclusion of public English school teachers from primary, secondary, and high school would have allowed to identify strong and weak TPACK in studied countries instead of an existing TPACK survey focusing only on secondary and high school English language teachers in Hungary, Kazakhstan, and Poland.

While I was able to observe remote English classroom observations in Hungary and Kazakhstan, it was not possible for me to observe the same in Poland because of the time delays in data collection. Furthermore, instead of limiting the questionnaire to English school teachers from public schools only, the inclusion of private English school teachers from primary, secondary, and high school would have provided more information about the TPACK characteristics of these teachers. It could have been possible to compare across participant types to identify how school structures mitigate TPACK weaknesses among teachers.

Another considerable limitation was in the absence of carrying out the pilot study using the TPACK questionnaire for English teachers from public schools in at least one country. The pilot study could have assisted in estimating the required time to collect quantitative data from this population. Furthermore, the pilot study might have aided my ability to envision the feasibility of this mixed methods convergent parallel study.

This research had several limitations. First, the sample size and lack of heterogeneity has limited the interpretability of the findings. Because of the selection bias, the participants who either spoke Kazakh or Russian or English could participate in this study that those who also spoke Hungarian and/or Polish. Additionally, this study reached participants possessing high educational degrees, digitally skillful, and financially capable being able to provide a strong Internet connection and bandwidth for interview or remote lesson observation purposes.

Second, the use of only online self-reporting instruments suggests caution is needed in interpreting the findings. This study used a self-reported TPACK questionnaire which may not be a valid tool to measure teachers' use of technology (Schmid et al., 2021). A suggestion to use data triangulation or conducting longitudinal studies could be used in studies to overcome this limitation.

Third, from a methodological perspective, employing mixed methods studies involving both quantitative and qualitative strands of data need to measure the same constructs. This mixed methods convergent parallel study measured TE and SL in parallel; however, the role of families was only explored through interviews with parents. Thorough planning of data collection in mixed methods is crucial for further data integration to facilitate data analysis via a joint display to confirm or juxtapose the quantitative and qualitative findings of a study. Furthermore, mixed

methods approach to studies should be chosen carefully in the future to evaluate the feasibility of a study and researcher's skills and capacity.

Fourth, this study lacks statistical generatability. However, from an epistemological standpoint, this study aimed to refine a model of TE to support SL in OLEs. This aim was achieved as a result of drawing meta-inferences and integrating data for convergence and divergence, according to the applied methodology of this study.

Fifth, the topic of research is closely related to the researcher's interests which might have biased the researcher in approaching a study, expressing attitudes, values, and beliefs that shaped the interpretation of the findings. However, to reduce the biases I used data triangulation during data collection, data analysis, and integration of results in mixed methods data interpretation stage. These tactics, discussed in detail in chapter 3, included member checking procedure, audit trail, use of different research methods, and sources of information to secure the accuracy of findings.

5.6.8 Future research

This doctoral study yielded several future lines of research into technology integration with pedagogy, methodology, especially in EdTech research, and educational policies. Future research should examine the dynamic relationships between the sub-elements of the three presences in the CoI, i.e., the teaching presence, cognitive presence, and social presence. More specifically, questions such as the following could be the focus of future studies: "Is perception of teaching presence associated with establishing group cohesion?" or "What hinders integration and resolution within the Community of Inquiry framework in teacher instructional practices in online learning?".

For future studies it is important to continue investigating the long-term impact of technology integration with teaching practices across research contexts and globally. Thus, a follow-up study measuring in-service (language) teachers' technology usage in remote, i.e., online teaching and learning can be conducted. Future multicultural studies could also involve several groups of participants with different SES to better examine the link between social and educational inequalities.

The present study highlighted future research to further explore assumptions embedded in observation instruments of synchronous or blended learning regarding teachers' roles and

responsibilities in the domains of OLEs, lesson planning and preparation, and instructional domains according to FfT (Danielson, 2013). Given the use of rubrics in observational instruments similarly to FfT, future investigations should query how observers arrive at ratings and teacher evaluations that determine teacher PD directions. In the absence of a rubric future studies need to explore and assess other models to build understanding and knowledge of TE in OLEs in contexts of high-tech and low-tech countries (Hazaea et al., 2021).

This research did not focus on changes in roles during the pandemic and/or social values representing parts of cultural structures in social systems in studied case studies. In terms of perspective and if an emergence and/or a crisis occurs requiring school closures, this research encourages studies examining family policies targeted at supporting low-income families, families and teachers that most likely to be at risk because of the digital divide.

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Appendices

Appendix A UNESCO ICT Competency Framework for Teachers (2018)

Appendix B: : Permission to use images of the Community of Inquiry framework

D. Randy Garrison <garrison@ucalgary.ca>
To: Stambekova Assel <assel.stambekova@ppk.elte.hu>
Tue 01/08/2023 17:16

Assel,
You have my permission to use the CoI framework and related figures in your doctoral work and future publications.
Best wishes,
DRG

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http://thecommunityofinquiry.org/

Appendix C: TPACK instrument

Total number of questions: 42 (demographics (4), TPACK-21 (38)
Demographics survey

Education

- BS
- MA
- Ph.D

Teaching experience

- 1-3 years
- 4-9 years
- 10-20 years
- 20+ years
- Other (please specify)

Age group

- 22-30
- 31-40
- 41-50
- 51-60
- 60+

Level of English taught

- Elementary
- Intermediate
- Secondary
- Others (please specify)

Technological Pedagogical and Content Knowledge for twenty-first century skills questionnaire (Valtonen et al., 2017)

Some definitions

- Reflective thinking – ability to consciously think about one's own studying, learning and skills

- Problem solving – ability to solve previously unknown tasks and problems by deduction and by combining previous information and experiences in a new way
- Creative thinking – ability to make use of one's own skills and to combine different sources of information in order to create something new
- Critical thinking – ability to process large amounts of information, to evaluate the reliability of information and to compare different sources of information
- Information and communications technology (ICT) – a wide arrange of different devices, such as computers, tablets, smart phones, etc., as well as web-based applications and software, social media services (e.g. blogs, Facebook, YouTube, WhatsApp, Instagram) and online learning environments (e.g. Moodle, Office365)

Scale used:
1. I need a lot of additional knowledge about the topic

2. I need some additional knowledge about the topic

3. I need a little additional knowledge about the topic

4. I have some knowledge about the topic
5. I have good knowledge about the topic
6. I have strong knowledge about the topic

Pedagogical knowledge (PK)

First, think how well you believe you know the processes of learning on a general level. Also consider in which areas you feel you need more information and in which areas you feel your current knowledge is sufficient or strong.

Evaluate your knowledge about the given topics:

PK1: Guiding students' discussions during group work (2-5 students)

PK2: Supporting students' critical thinking
PK3: Guiding students in planning their own learning
PK4: Supporting students' reflective thinking

PK5: Guiding students to make use of each other's thoughts and ideas during group work (2-5 students)
PK6: Supporting students' problem-solving skills
PK7: Supporting students' creative thinking

Technological knowledge (TK)

Next, consider your own relationship with information and communications technology (ICT). How do you perceive your knowledge and your skills?

Evaluate your knowledge and skills in the given topics:

TK1: I can solve ICT related problems
TK2: I am familiar with new technologies and their features

TK3: I can use new technologies
TK4: I know several websites about new technology

Content knowledge (CK)

(Note: The CK in this TPACK-21 questionnaire is always content specific, i.e., languages in this case).

Next think about your content expertise in language teaching. Please consider how well you believe you know the subject contents and in which areas you feel you need additional information or in which areas you feel your knowledge is sufficient or strong.

Evaluate your knowledge in the given topics:

CK1: I have sufficient knowledge in developing contents in languages

CK2: I know the basic theories and concepts of languages
CK3: I know the history and development of important theories in languages

CK4: I am familiar with recent research in languages

Interaction between pedagogical and content knowledge (PCK)

Now consider your pedagogical knowledge in languages together. Please consider in which areas you feel you need additional information or in which areas you feel your knowledge is sufficient or strong.

Evaluate your knowledge about the given topics:

PCK1: In languages, I know how to guide students' content-related problem solving in groups (2-5 students)
PCK2: In languages, I know how to guide students' critical thinking
PCK3: In languages, I know how to guide students to make use of each other's thoughts and ideas in group work (2-5 students)

PCK4: In languages, I know how to guide students' reflective thinking
PCK5: In languages, I know how to guide students in planning their own learning

PCK6: In languages, I know how to guide students' creative thinking

Interaction between technological and pedagogical knowledge (TPK)

Next we consider the possibilities of using ICT in teaching. First think on a general level about how well you are familiar with using technology to realise your pedagogical goals. Please consider in which areas you feel you need additional information or in which areas you feel your knowledge is sufficient or strong.

Evaluate your knowledge about the given topics:

TPK1: I know how to use ICT in teaching as a tool for students' reflective thinking
TPK2: I know how to use ICT in teaching as a tool for students to plan their own learning

TPK3: I know how to use ICT in teaching as a tool for sharing ideas and thinking together

TPK4: I know how to use ICT in teaching as a tool for students' creative thinking
TPK5: I know how to use ICT in teaching as a tool for students' problem solving in groups (2-5 students)
TPK6: I know how to use ICT in teaching as a tool for students' critical thinking

Interaction between content and technological knowledge (TCK)

Please consider now, how well you know the technologies that are used in professions related to natural sciences.

Evaluate your knowledge about the given topics:

TCK1: I know websites with online materials for studying languages
TCK2: I know ICT-applications which are used by professionals in languages

TCK3: I know ICT-applications which I can use to better understand the contents of languages

TCK4: I know technologies which I can use to illustrate difficult contents in languages

Interaction between pedagogical, technological, and content knowledge (TPACK)

(Note. TPACK factor internal consistency with the current data is strong, Cronbach's $\alpha = 0.96$.)

Now we add all the segments together. Please consider your pedagogical, technological and content knowledge in languages together. Please consider in which areas you feel you need additional information or in which areas you feel your knowledge is sufficient or strong.

Evaluate your knowledge about the given topics:

TPACK1: In teaching languages, I know how to use ICT as a tool for sharing ideas and thinking together
TPACK2: In teaching languages, I know how to use ICT as a tool for students' reflective thinking

TPACK3: In teaching languages, I know how to use ICT as a tool for students to plan their own learning
TPACK4: In teaching languages , I know how to use ICT as a tool for students' problem solving in groups (2-5 students)

TPACK5: In teaching languages, I know how to use ICT as a tool for students' creative thinking
TPACK6: In teaching languages, I know how to use ICT as a tool in group work (2-5 students)

TPACK7: In teaching languages, I know how to use ICT in teaching as a tool for students' critical thinking

Appendix D: CoI instrument

Community of Inquiry Survey Instrument (draft v14)

Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. The Internet and Higher Education, 2(2-3), 87−105

Teaching Presence

Design & Organization

1. The instructor clearly communicated important course topics.

2. The instructor clearly communicated important course goals.

3. The instructor provided clear instructions on how to participate in course learning activities.

4. The instructor clearly communicated important due dates/time frames for learning activities.

Facilitation

5. The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.

6. The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking.

7. The instructor helped to keep course participants engaged and participating in productive dialogue.

8. The instructor helped keep the course participants on task in a way that helped me to learn.

9. The instructor encouraged course participants to explore new concepts in this course.

10. Instructor actions reinforced the development of a sense of community among course participants.

Direct Instruction

11. The instructor helped to focus discussion on relevant issues in a way that helped me to learn.

12. The instructor provided feedback that helped me understand my strengths and weaknesses relative to the course's goals and objectives.

13. The instructor provided feedback in a timely fashion.

Social Presence
Affective expression

14. Getting to know other course participants gave me a sense of belonging in the course.

15. I was able to form distinct impressions of some course participants.

16. Online or web-based communication is an excellent medium for social interaction.

Open communication
17. I felt comfortable conversing through the online medium.

18. I felt comfortable participating in the course discussions.

19. I felt comfortable interacting with other course participants.

Group cohesion
20. I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.

21. I felt that my point of view was acknowledged by other course participants.

22. Online discussions help me to develop a sense of collaboration.

Cognitive Presence
Triggering event
23. Problems posed increased my interest in course issues.

24. Course activities piqued my curiosity.

25. I felt motivated to explore content related questions.

Exploration
26. I utilized a variety of information sources to explore problems posed in this course.

27. Brainstorming and finding relevant information helped me resolve content related questions.

28. Online discussions were valuable in helping me appreciate different perspectives.

Integration
29. Combining new information helped me answer questions raised in course activities.

30. *Learning activities helped me construct explanations/solutions.*

31. Reflection on course content and discussions helped me understand fundamental concepts in this class.

Resolution

32. I can describe ways to test and apply the knowledge created in this course.

33. I have developed solutions to course problems that can be applied in practice.

34. I can apply the knowledge created in this course to my work or other non-class related activities.

5 point Likert-type scale

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

Appendix E: Interview protocol for participants: Students

Time of interview:

Date:

Place:

Interviewee:

Principal Investigator (PI): Good morning/ afternoon! Thank you for agreeing and joining a research study which aims to explore and understand teachers' and families' roles in supporting students' learning and inquiring about teachers' student-oriented pedagogies with the help of educational technology.

To achieve this purpose I am going to conduct individual interviews with secondary school foreign teachers. I hope to receive full and outspoken answers from my interviewees. Please, be assure that all data collected will be confidential and your answers stay anonymous. Our interview will be audio recorded with your permission and stored in a password protected file which will be subsequently destroyed after five years upon the completion of the research. This is the first interview and it will be about an hour long.

Please read again and sign the consent form.

[Ask the interviewee's permission to use the tape recorder.]

[Test the audio recorder]

Let me ask you for some general personal information.

Background information

Pseudonym to use in the study:

Main interview questions:

Question Item	**Link to RQ**	**Participant (-s)**
1.Let's start with the first question. How was it like studying remotely at home?	RQ1	Students
2. In your view, how can technology make English language learning better both for teachers and students?		
3. What helped you learn English language at home when you had virtual lessons?		
3.1 What educational technologies helped you?		

4.How easy could you access educational technology used at your remote English lessons from home?		
5.How would you describe your experience in understanding your English teacher's instructions at remote lessons?		
6. Did your English teacher use technology in any way when there somebody was misbehaving in remote lessons?		
7. Did you feel safe and confident to participate in remote lessons using technology?		
8. How did you use technology when you needed help in understanding the lesson during the lesson?		
9. How did you use technology to use new knowledge from English lessons in real life?	RQ1	
10. How did you use technology to communicate with other students and English language teacher during and after remote lessons?		
11. Did you see your classmates interested in studying online from home during lockdown? What did you feel when you saw them engaged?	RQ1	
12. How did you use technology to tell your English teacher any information? For example, when you asked for help or when you showed homework?		
13. In what way do you think technology helped you learn English better, do you think?		
14. How did you motivate yourself to study remotely?		
15.What benefits did you see in studying from home?		
16. Were there any disadvantages? If yes, what?		
17. What did you miss from school while studying at home?	RQ2	
17.1 How did you learn it?		
18. Was there a moment when you were not interested in studying from home? What was it, do you remember?		
19. How did you organise your learning time?	RQ2	
20.How do you think your study habits and attitudes have changed with the switch to the forced online learning?	RQ2	
21. What was challenging for teachers in adapting to remote teaching in such a short time in your opinion?	RQ3	

Appendix E: Interview protocol for participants: Families (any family member)

Time of interview:

Date:

Place:

Interviewee:

Principal Investigator (PI): Good morning/ afternoon! Thank you for agreeing and joining a research study which aims to explore and understand teachers' and families' roles in supporting students' learning and inquiring about teachers' student-oriented pedagogies with the help of educational technology.

To achieve this purpose I am going to conduct individual interviews with secondary school foreign teachers. I hope to receive full and outspoken answers from my interviewees. Please, be assure that all data collected will be confidential and your answers stay anonymous. Our interview will be audio recorded with your permission and stored in a password protected file which will be subsequently destroyed after five years upon the completion of the research. This is the first interview and it will be about an hour long.

Please read again and sign the consent form.

[Ask the interviewee's permission to use the tape recorder.]

[Test the audio recorder]

Let me ask you for some general personal information.

Background information

Pseudonym to use in the study:

Have you used any educational technologies at home in your child's learning before COVID-19? If yes, what were they? How often did your child use it? Why did you use it?

Main interview questions:

Question Item	**Link to RQ**	**Participant (-s)**
1.Let's start with the first question. What is your experience with using educational technologies in your child's learning at home?	RQ1	Families
2. In your view, how can technology make English language learning and engagement better both for teachers and students?		

3. Did you notice or observe what important features helped your child in language learning at home? In what way?		
4. Could you describe if educational technology tools that your child used at home helped him learn English language better in comparison to school?		
5. Did you see how educational technology tools that your child used helped him/her feel pride for their work? In what way?		
6. Do you know how educational technology tools your child used at remote lessons supported him/her in navigating in online classrooms? For example, accessing lesson materials? Or following teacher's instructions?		
7. Do you know how educational technology tools your child used at remote lessons supported him/her in regulating his/her behaviour at online lessons? In what way?		
8. Do you know how teacher used technology when your child misbehaved at online lessons? In what way?		
9. Do you know how technology your child used for remote learning provided him/her with safety and accessibility to learning? In what way?		
10. When your child needed some help to understand the lesson, did s/he use technology to clarify the question? Or did s/he ask for teacher's help?		
11. In your view, how students can apply the newly gained knowledge to real life with the help of technology?	RQ1	
12. Could you describe how educational technology tools that your child used helped him/her communicate with other students and English language teacher?	RQ1	
13. How did you monitor your child's learning?		
14. How did you organise your child's learning time?		
15. Could you describe how educational technology tools that your child used helped him/her give feedback to the English teacher?		
16. In what way educational technology tools your child used met his/her learning needs during remote learning at home?		
17. Let's now turn to talking about how home-schooling experience was for you and your family. Could you describe in one sentence what the experience was like for you and your family?		
18.What benefits did you see in studying from home?		
19. Were there any disadvantages? If yes, what?	RQ2	
20. What did you learn about student remote learning at home in general?		
20.1 How did you learn it?		
21. What can schools do to provide an engaging learning to their students online?		

22. Now that we talked about differences between formal learning space such as schools and homes that have substituted schools, in your opinion what can schools learn from home schooling experience? For example, is there anything missing in schools that you noticed that was present in homes and that supported your child in learning?	RQ2	
23.Do you think your role as a parent changed since the beginning of the pandemic regarding your child's learning? If yes, how? What changed?		
23.1 How did you help the child to adjust to studying from home virtually?		
24. How did you communicate with teachers about your child's learning during the home-schooling experience?		
25.How technologically prepared did you think you were to help your child study online?	RQ2	
26. What digital learning materials did you provide your child with?		
27. Did you have to actively encourage or 'push' your child to study online?		
28. Did your child have a quiet place to study online at home?		
29. What was challenging for teachers in adapting to remote teaching in such a short time in your opinion?	RQ3	

Appendix E: Interview protocol for participants: Educational Technology experts

Time of interview:

Date:

Place:

Interviewee:

Principal Investigator (PI): Good morning/ afternoon! Thank you for agreeing and joining a research study which aims to explore and understand teachers' and families' roles in supporting students' learning and inquiring about teachers' student-oriented pedagogies with the help of educational technology.

To achieve this purpose I am going to conduct individual interviews with secondary school foreign teachers. I hope to receive full and outspoken answers from my interviewees. Please, be assure that all data collected will be confidential and your answers stay anonymous. Our interview will be audio recorded with your permission and stored in a password protected file which will be subsequently destroyed after five years upon the completion of the research. This is the first interview and it will be about an hour long.

Please read again and sign the consent form.

[Ask the interviewee's permission to use the tape recorder.]

[Test the audio recorder]

Let me ask you for some general personal information.

Background information

Pseudonym to use in the study:

How long have you worked in educational technology field?

Have you worked with educational institutions in for example, helping them integrate technology into their teaching before COVID-19? If yes, did you continue working with them during COVID-19?

Main interview questions:

Question Item	**Link to RQ**	**Participant (-s)**
1.Let's start with the first question. In your view, how can technology make learning and teaching engaging both for teachers and students?	RQ1	Educational technology experts
2.Could you give an overview of how current major educational technologies meet school students' (teenagers) learning needs and teachers' teaching needs?		
3.Could you describe how current major educational technology tools support teacher-learner interactions? And learner-learner interactions?		
4. How do big EdTech players help teachers deliver engaging learning experiences for secondary school students?		
5. What essential features help improve teaching outcomes for teachers and learning outcomes for students in available EdTech?		
6. How do you think integrating technologies to a teacher's repertoire of tools improves his/her language teaching?		
7. How do major educational technologies benefit students in improving English language learning? Describe, please	RQ1	
8.What do major educational technologies lack in helping students learn English?		
9. How should technologies be designed to engage students' in language learning at a deeper level, creating social presence as if in offline settings?	RQ1	

10. What do major educational technologies lack at present in creating social presence for language teachers and language learners?		
11. Are you aware of challenges teachers, schools, families and students had/ are having during remote teaching and learning? If yes, what can EdTech learn from these challenges?	RQ2	
12. Link to the previous question. If the participant said Yes, then How can educational technologies adapt to make language teaching for teachers and learning for students and families more engaging?	RQ2	
13. What else do I need to know to understand your views in the previous question?		

Appendix E: Interview protocol for participants: Schoolteachers

Time of interview:

Date:

Place:

Interviewee:

Principal Investigator (PI): Good morning/ afternoon! Thank you for agreeing and joining a research study which aims to explore and understand teachers' and families' roles in supporting students' learning and inquiring about teachers' student-oriented pedagogies with the help of educational technology.

To achieve this purpose I am going to conduct individual interviews with secondary school foreign teachers. I hope to receive full and outspoken answers from my interviewees. Please, be assure that all data collected will be confidential and your answers stay anonymous. Our interview will be audio recorded with your permission and stored in a password protected file which will be subsequently destroyed after five years upon the completion of the research. This is the first interview and it will be about an hour long.

Please read again and sign the consent form.

[Ask the interviewee's permission to use the tape recorder.]

[Test the audio recorder]

Let me ask you for some general personal information.

Background information

Pseudonym to use in the study:

Which city do you work in?

What is your role in the school? (if a teacher, what grade-level, age-group and subject)

What kind of school do you teach? (e.g. public, grammar, mixed languages, one gender or mixed genders)

How long have you worked in this school?

How long have you worked in education? (e.g. in teaching, in school administration, or both)

Main Interview Questions

Question Item	**Link to RQ**	**Participant (-s)**
1.Let's start with the first question. Did you use any educational technology (edtech in short) in your teaching or lesson planning, curriculum design before COVID-19? If yes, what were these and what was it like to teach online for you? How did you feel about it? If no, why?	RQ1, 1.1. How educational technology can be used to support student-centred pedagogy?	English School teachers
1.1 In your view, how can technology make learning and teaching engaging and authentic both for teachers and students? (Authentic in a sense of learning that happens between teachers and learners)		
2.Could you give an overview of how current major educational technologies, that perhaps you used, meet school students' (teenagers) learning needs and teachers' teaching needs?		
3.Could you describe how current major educational technology tools support teacher-learner interactions? And learner-learner interactions?		
4. Could you describe how educational technology tools that you used helped you create or show your expectations for learning and achievement toward students?		
5. Could you describe how educational technology tools that you used helped your students feel pride for their work?		
6. Could you describe how educational technology tools that you used helped you manage classroom environment? Specifically: a) in giving instructions; b) in transitioning from one stage of a lesson to the next; c) in sharing materials and other resources for the lesson; d) in delegating classroom		

responsibilities to students (sub-questions a-d will be asked in order)		English School teachers
7. Could you describe how educational technology tools that you used helped you monitor student behaviour?		
8. Could you describe how educational technology tools that you used helped you in responding to student misbehaviour?		
9. Could you describe how educational technology tools that you used helped you provide safety and accessibility to students?		
10. Did you give personalised instruction to students in need? For example, did you have so-called "office hours" when students could meet with you online to talk about their learning, issues, etc?		
11. Could you describe how educational technology tools that you used helped you engage students in learning? For example, what activities and assignments did you use?	RQ1, 1.2 How educational technology can be used to help students gain cognitively?	
12. Could you describe how educational technology tools that you used helped you to monitor student learning?		
13. How learners were able to apply the newly gained knowledge to real life with the help of technology?		
14. What features of educational technology allowed students integrate their new knowledge?		
14. Could you describe how educational technology tools that you used helped you communicate with students?		
15. Link to a previous question. For example, how did you use technology to: a) explain lesson content? b) to set use oral and written language?		
16. How did you organise grouping of students in virtual learning environment?		
17. How was the structure and pacing of your lesson different from a conventional classroom lesson?		
18. Could you describe how educational technology tools that you used helped you to give feedback to students?		
19. Could you describe how educational technology tools that you used helped you promote		

student self-assessment? Did they have any assessment critreria?		English School teachers
20. Could you describe how educational technology tools that you used helped you adjust lessons in challenging situations?		
20.1 For example, what kind of modifications did you make to the curriculum you taught? Could you give an example?		
21. Could you describe how educational technology tools that you used helped you to respond to students' needs during or after the lesson?		
22. What did you learn about student remote learning at home?	RQ2, 2.1 What can teacher community and schools learn from an experience of reaching their students online?	
22.1 How did you learn it?		
23. What can schools do to provide an engaging learning to their students online?		
24. How do you think your students' study habits and attitudes have changed with the switch to the forced online learning?	RQ2, 2.2 How can students' learning leverage home and school community settings as funds of knowledge?	
25. How did you involve parents in supporting students' learning		
26. How did you connect with students' home cultures that you could you use for remote teaching?		
27. Which home or community practices related to your students' English language learning that you are aware of can you use in your remote teaching?		
28. What kind of advantages and disadvantages there are in student remote learning experience at home?	RQ2, 2.3 How do educational technology and home environment redefine teacher relationships with families?	English School teachers
29. How will it be different for students and for you when learning takes place in traditional classrooms with minimal risks for everyone?		
30. Did you have students with special needs in your class? Or students with low access to computer, smartphone or the Internet?	RQ3, 3.1. How did schools and teachers ensure participation of students-at-risk (students with special needs, urban students, digitally divided students)?	
30.1 How did learning happen to them? Did they receive any support from schools or from teachers in general?		

31. What was challenging for you in adapting to remote teaching in such a short time?	RQ3, 3.3 How did teachers adapt to remote teaching and learning so abruptly?	

Appendix F Observation form

The Framework for Teaching Evaluation Instrument, 2013 Instructionally Focused Edition, Charlotte Danielson (2013); adapted for the research study

ELEMENT	DOMAIN 2: THE CLASSROOM ENVIRONMENT Component 2a: Creating An Environment Of Respect And Rapport LEVEL OF PERFORMANCE			
	UNSATISFACTORY	BASIC	PROFICIENT	DISTINGUISHED
Teacher interaction with students				
Student interaction with other students				
	Component 2b: Establishing a Culture for Learning			
Importance of the content and of learning				
Expectations for learning and achievement				
Student pride in work				
	Component 2c: Managing Classroom Procedures			
Management of instructional groups				
Management of transitions				
Management of materials and supplies				
Performance of classroom routines				
	Component 2d: Managing Student Behavior			
Expectations				
Monitoring of student behavior				
Response to student misbehavior				
	Component 2e: Organizing Physical Space			
Safety and accessibility				
Arrangement of furniture and use of physical resources				
	DOMAIN 3: INSTRUCTION			

	Component 3a: Communicating with Students			
Expectations for learning				
Directions for activities				
Explanations of content				
Use of oral and written language				
	Component 3b: Using Questioning and Discussion Techniques			
Quality of questions/prompts				
Discussion techniques				
Student participation				
	Component 3c: Engaging Students in Learning			
Activities and assignments				
Grouping of students				
Instructional materials and resources				
Structure and pacing				
	Component 3d: Using Assessment in Instruction			
Assessment criteria				
Monitoring of student learning				
Feedback to students				
Student self-assessment and monitoring of progress				
	Component 3e: Demonstrating Flexibility and Responsiveness			
Lesson adjustment				
Response to students				
Persistence				

Appendix G: Recruitment materials

Did you have to teach English remotely because of COVID-19?

English teachers who were forced to teach remotely because of COVID-19 are invited to voluntarily participate in a research study. The study explores teachers' and families' roles in supporting student learning and maximising teacher effectiveness.

This study will be conducted by Eötvös Loránd University Doctoral Student Stambekova Assel in Hungary, Poland and Kazakhstan. Participation is voluntarily. You are asked to fill in an online questionnaire followed by an optional online interview. All communication will be anonymous and confidential. Please contact the researcher Stambekova Assel, if interested in participating in this study.

Contact: Stambekova Assel, *Doctoral Candidate In Teacher Education*
assel.stambekova@ppk.elte.hu

Did you have to study English at home because of COVID-19?

Families and students who had to study English at home because schools were closed during COVID-19 are invited to participate in this study. This study explores teachers' and families' roles in supporting student learning and maximising teacher effectiveness.This study will be conducted by Eötvös Loránd University Doctoral Student Stambekova Assel in Hungary, Poland and Kazakhstan. Participation is voluntarily. Students are asked to fill in an online questionnaire followed by an optional 30-minute online interview. Families are invited for a 90-minute interview. All communication will be anonymous and confidential. Please contact the researcher Stambekova Assel if interested in participating in this study.

Contact: Stambekova Assel, *Doctoral Candidate In Teacher Education*

assel.stambekova@ppk.elte.hu

Are you EdTech professional? Have something to say howEdtech changed during COVID-19?

Educational technology professionals are invited to take part in this study which explores teachers' and families' roles in supporting student learning and maximising teacher effectiveness. Your voice as a professional from EdTech industry can help to have comprehensive understanding of the current remote language teaching and learning. This study will be conducted by Eötvös Loránd University Doctoral Student Stambekova Assel in Hungary, Poland and

Kazakhstan.Participation is voluntarily. You are invited to an online 60- minute interview. All communication will be anonymous and confidential. Please contact the researcher Stambekova Assel if interested in participating in this study.

Contact: Stambekova Assel, Doctoral Candidate In Teacher Education
assel.stambekova@ppk.elte.hu

Appendix H: Codebook of the measured constructs

Digital divide codebook

Code	Description	Example	Inclusion criteria and examples	Exclusion criteria and atypical exemplars
D1	First-Level Digital Divide	Lack of access to digital technologies, often due to economic or geographical constraints.	Data should focus on the availability and accessibility of digital infrastructure such as broadband internet, computers, and devices such as smartphones, tablets, iPad, computers, and laptops. Data should provide information on the quality, speed, and reliability of available digital infrastructure. Examples could include a degree of a bandwidth for video calls and video live streaming. Or a number of households with broadband access in rural and urban settings.	Data unrelated to the availability or accessibility of digital infrastructure. Data that doesn't specify the geographic location or context of the infrastructure. Atypical data might include personal anecdotes or case studies of individuals who live in remote areas with unexpectedly good digital infrastructure. Data from a highly controlled experimental study that doesn't reflect real-world infrastructure disparities.
OD1	Lack of Physical Access	People in remote areas without internet access		
OD2	Economic Barrier	Low-income individuals unable to afford devices		
OD3	Lack of Infrastructure	Absence of broadband in rural communities		
D2	Second-Level Digital Divide	Having access to digital technologies but lacking the necessary skills and knowledge to effectively use them	Data should focus on how individuals or communities use digital technology, including internet activities and services. Data should indicate variations in digital technology adoption and usage patterns. Examples include surveys on the frequency of	Data unrelated to digital technology usage and data that doesn't provide insights into differences in usage across groups or contexts. Examples of atypical data might include an in-depth ethnographic study of a small community that defies common
SD1	Digital Illiteracy	Inability to navigate online platforms		
SD2	Limited Technological Proficiency	Difficulty in using software and applications		

SD3	Information Literacy Gap	Inability to critically assess online information	internet use for various purposes (e.g., education, work, entertainment) among different demographic groups. Usage statistics for specific online services or platforms.	usage patterns due to unique cultural practices. Atypical data from a survey conducted in an environment where digital technology is not readily accessible to anyone, making usage statistics irrelevant.
D3	Third-Level Ditigal Divide	Unequal distribution of power and benefits derived from digital technologies, resulting in social exclusions, economic and educational inequalities, or political disparities.	Data should focus on the digital skills and literacy levels of individuals or groups. Data should provide insights into the ability to critically assess and use digital information. Examples: Typical data might include standardized tests or assessments of digital literacy skills. Qualitative data from interviews or focus groups discussing challenges related to understanding and using digital information.	Data unrelated to digital literacy or skills. Data that doesn't assess or measure digital literacy in some way. Examples of atypical data might include an analysis of social media posts that doesn't directly assess digital literacy but indirectly reveals patterns of misinformation spread. Data from a region where digital literacy levels are uniformly high across all demographic groups.
UD1	Passive Consumption	Only using the internet for entertainment		
UD2	Restricted Participation	Limited engagement in online social interactions		
UD3	Lack of Access to e-Services	Missing out on online government services		

Community of Inquiry codebook

Code	Description	Inclusion criteria	Example of a teaching instruction	Popular instructional tools to implement practices
Cognitive Presence (CP)	Concerned with students' / learners' development of critical and higher-order thinking. It is operationalised through the four phases of inquiry learning: 1) triggering event (problem conceptualisation); 2) exploration (idea generation); 3) integration (knowledge synthesis), 4) resolution (knowledge application and vicarious testing) (Garrison et al., 2001; Choy & Quek, 2016).			

1. Triggering event	A course instructor/ teacher introduces a problem or dilemma.	Data that signifies the introduction of a problem, question, or challenge that initiates cognitive engagement.	1. Raise topics to spark curiosity (Krzyszkowska, K., and Mavrommati, M., 2020). 2. Educational videos to hook student attention in the course content (Sanders, K., & Lokey-Vega, A. (2020). K-12 Community of Inquiry: A case study of the applicability of the Community of Inquiry framework in the K-12 learning environment. Journal of Online Learning Research, 6(1), 35-56.). 3. Connecting a focus of learning to the real world by illustrating the effects (Sanders, K., & Lokey-Vega, A. (2020). K-12 Community of Inquiry: A case study of the applicability of the Community of Inquiry framework in the K-12 learning environment. Journal of Online Learning Research, 6(1), 35-56.)	Discussion forums, orientation in a dashboard (Rodríguez-Triana, M. J., Prieto, L. P., Ley, T., de Jong, T., & Gillet, D. (2020). Social practices in teacher knowledge creation and innovation adoption: a large-scale study in an online instructional design community for inquiry learning. International Journal of Computer-Supported Collaborative Learning, 15, 445-467.), slide shows, word documents, audio recordings, video recordings, memes, Kahoot! , polling, YouTube videos as a hooking strategy (Sanders, & Lokey-Vega, 2020). Use of blogs (Popescu, E., & Badea, G. (2020). Exploring a Community of Inquiry Supported by

				a Social Media-Based Learning Environment. Educational Technology & Society, 23 (2), 61–76.)
2. Exploration	Students/ Learners move on to the next stage: brainstorming and other activities. Here they collect information relevant to the problem or task at hand.	Data demonstrating the process of investigating, gathering information, or seeking diverse perspectives related to the triggering event.	1. Ask students/ learners to brainstorm a solution to a problem of practice (Chen et al., 2019) via oral and/ or video presentations, use online resources in the class' Edmodo (Zalavra, E., & Makri, K. (2022). Relocating Online a Technology-Enhanced Microteaching Practice in Teacher Education: Challenges and Implications. Electronic Journal of e-Learning, 20(3), 270-283). 2. Use Socratic seminar for discussions (Sanders, & Lokey-Vega, 2020).	Padlet, MeetingWorlds, Wordle, StormBoard (Zalavra & Makri, 2022), virtual dialogues (Krzyszkowska, K., and Mavrommati, M., 2020. Applying the Community of Inquiry e-Learning Model to Improve the Learning Design of an Online Course for In-service Teachers in Norway. The Electronic Journal of e-Learning, 18(6), pp. 462-475, available online at www.ejel.org)

3. Integration	Next, students/ learners selectively synthesize and integrate different components of information. Students/ Learners need to filter out irrelevant information. This stage is characterised of higher levels of cognitive presence.	Data showcasing the process of connecting, synthesizing, and making sense of information or perspectives gathered during exploration.	Assign a student/ a learner to summarize other students' posts over the past week and share their synthesis. Ask students/ learners to filter post similar and different replies, or replies agreement and disagreement in the discussion forums (Zalavra & Makri, 2022).	Opinion Polls in Google Forms (Zalavra & Makri, 2022), individual assignments (Archer, 2010)
4. Resolution	Students/ Learners need to resolve an original problem.	Data indicating the conclusion, decision, or resolution reached as a result of cognitive engagement with the triggering event.	Launch a new learning cycle/ module within the course with an accompanying new triggering event (Kovanović et al., 2015). Allocate more time for resolution boosted by the formative feedback and facilitation to increase students'/ learners' knowledge construction	Use modeling and information-organisers such as tables to help students/ learners during the resolution phase. Teachers/ course instructors are encouraged to engage in discussion with students to faciltiate Integration and Resolution.

Teaching Presence (TP)	Informs about an instructors' role before and during the course, including 1) course organisation and design; 2) direct instruction, and 3) facilitation (Anderson et al., 2001; Garrison et al., 2010). This presence ese elements promotes cognitive and social processes to realize personally meaningful and educationally valuable learning outcomes (McKerlich et al., 2011; Wang & Liu 2019, p. 2). Garrison (2000) explained how technology tools and teaching strategies help create TP to transform OLEs to communities of inquiry.			Discussion forums (Moore, R. L., & Miller, C. N. (2022). Fostering Cognitive Presence in Online Courses: A Systematic Review (2008-2020). Online Learning, 26(1), 130-149.)

1. Instructional design and organisation	Refers to teachers engaging to design and organize a course or learning environment (Kilis, S., & Yildirim, Z. (2019). Posting patterns of students' social presence, cognitive presence, and teaching presence in online learning. Online Learning, 23(2).	Data that demonstrates the teacher's planning, organization, and structuring of the online learning environment.	1. Consideration of student context, degree programme and level of study (Roulston et al., 2018; Sadaf & Olesova, 2017) 2. Mapping course objectives to learning outcomes (Cho & Tobias, 2016) 3. Structuring the objectives to enhance conceptual understanding (Cho & Tobias, 2016) 4. Guiding students how to learn online and helping them develop skills in learning strategies and explaining the importance of collaborative learning (Junus et al., 2019) 5. Providing an integrated working space, with easy-to-use platforms and minimising workload of mechanical activities, e.g., providing direct links for textbooks (Kilis & Yildirim, 2018). 6.Communication of course content, learning goals, assessment and learning activities, and teacher's communication of the organisational aspects of the course (e.g., due dates and timetables)	Use of blogs, Twitter, dashboard in learning management systems (Popescu, E., & Badea, G. (2020). Exploring a Community of Inquiry Supported by a Social Media-Based Learning Environment. Educational Technology & Society, 23 (2), 61–76.)

2. Facilitation	Refers to teachers facilitating the activities of students/ learners as they agree or disagree and seek to reach consensus (Kilis, S., & Yildirim, Z. (2019). Posting patterns of students' social presence, cognitive presence, and teaching presence in online learning. Online Learning, 23(2).	Data showing how the teacher fosters a collaborative and supportive online learning community.		Learning management systems such as Moodle or Canvas; Power Point slides (Sanders & Lokey-Vega, 2020)
3. Direct Instruction	Explains how the teacher reacts to students' discussions and provides feedback	Data indicating the teacher's provision of content, guidance, and feedback to facilitate student learning.	1. Scaffold learning experiences (Rolim et al., 2019) 2. Provide exemplars and grading rubrics (B. Chen et al., 2017) 3. Share experiences and ask probing questions (Clarke & Bartholomew, 2014) 4. Group feedback and further clarification from the facilitator despite learning the theory through videos and other resources (le Roux & Nagel, 2018) 5. Provide constructive feedback that would lead to a new understanding of content (Daspit et al., 2015)	Edpuzzle, Quizziz, Kahoot!, Nearpod, Google geography app, Google tours, Google maps (Sanders & Lokey-Vega, 2020)

Social Presence (SP)	Refers to the development of social interactions among the learning group within a productive social climate. It includes 1) open communication; 2) effective expression, and 3) group cohesion (Serembus & Murphy, 2020)			
1. Open communication	Includes continuing a thread, quoting from others' messages, referring explicitly to others' messages, asking questions, complimenting or expressing appreciation, expressing agreement	Data demonstrating the creation of an environment where students feel comfortable sharing ideas and engaging in discussions.	Includes continuing a thread, quoting from others' messages, referring explicitly to others' messages, asking questions, complimenting or expressing appreciation, expressing agreement via Facebook group and/or the WhatsApp group, providing teachers' feedback, encouraging students' collaboration, be able to contact a teacher/ course instructor when needed. (Lim & Richardson, 2016; Lowenthal & Dunlap, 2018; Kilis & Yildirim, 2019; Sanders & Lokey-Vega, 2020)	Ice-breaker activities that help students get to know each other, holding synchronous hours, and learning activities that encourage students for content-related interaction. Video feedback, video announcements (Caskurlu et al., 2021).
2. Affective expression	Corresponds to students' sense of knowing each other, social interactions,	Data reflecting emotional and expressive aspects of communication that contribute	1. Sharing personal information (Yildiz, 2009; Kear, 2010; Kaban, 2021). 2. Small group	Flipgrid, Breakout Edu, Loom and Remind (Holbeck and Hartman, 2018)

	and sense of belonging to the course	to building a sense of community.	discussions (Sanders & Lokey-Vega, 2020; Kaban, 2021)	
3. Group cohesion	A sense of group commitment, a feeling that the class is a community in which participants interact around shared intellectual activities and tasks (Day et al., 2013, p. 397)	Data showing the development of a supportive and connected online learning community.	1. Vocatives, referring to the learning group using inclusive pronouns, common salutations, and so on. (Rourke, Anderson, Garrison, & Archer, 2001). 2. Fostering positive learning environment (Sanders & Lokey-Vega, 2020) through kind behaviors (Kilis & Yildirim, 2019)	Social media such as Facebook page or a WhatsApp group (Kilis & Yildirim, 2019)

TPACK-21 codebook. *Based in Chai, Koh and Tsai (2011), Koh, Chai and Tsai (2013) and Mishra and Koehler (2006).

Code	Description	Example	**Inclusion criteria and Examples**	**Exclusion criteria and Atypical exemplars**
Pedagogical Knowledge (PK)	In-depth knowledge about methods of teaching and learning	Knowledge of how to use project-based learning	Instructional Strategies: Data that demonstrates the teacher's understanding of effective teaching methods and strategies. For example, a lesson plan. Classroom Management: Data showing how the teacher manages the classroom and student interactions. For example, record illustrating teacher's professional development on classroom management; teacher's examples of student-friendly and inclusive approach in classroom management.	Irrelevant Pedagogical Information: Information unrelated to instructional strategies or classroom management. Non-Teaching Pedagogy: Pedagogical knowledge unrelated to educational contexts. Examples include information unrelated to pedagogical knowledge.
Content Knowledge (CK)	Knowledge about the subject matter that is being taught or learned	Knowledge about English	Subject Matter Expertise: Data that indicates the teacher's deep understanding of the content they are teaching. For example, teacher's quotes illustrating understanding the curriculum or its cross-subject interrelations. Curriculum Alignment: Data showing how content knowledge aligns with curriculum standards.	Irrelevant Content Information: Information unrelated to the subject matter being taught. Examples include: unrelated information about content knowledge. Non-Educational Content: Content knowledge unrelated to educational contexts.

Technological Knowledge (TK)	Knowledge of how to use technological tools such as hardware, software, and the Internet	Knowledge on how to use Web 2.0 tools (example Wiki, Blogs, Facebook).	Technology Proficiency: Data that demonstrates the teacher's proficiency with technology tools and devices. Examples include evidence demonstrating teacher's understanding and use of software and hardware for instructional purposes. Software and Hardware Skills: Data indicating familiarity with educational technology software and hardware.	Irrelevant Technological Information: Information unrelated to educational technology. Examples include information such as teacher's personal profile of social media or use of technology for other purposes but teaching and learning. Non-Educational Technology Skills: Technological knowledge unrelated to educational contexts.
Pedagogical Content Knowledge (PCK)	The blend of content and pedagogy into an understanding and development of improved teaching practices in the content area	Knowledge on how to conduct communicative-oriented classes to teach speaking.	Integration of Pedagogy and Content: Data showing how the teacher integrates pedagogical strategies with subject matter. Examples include lesson plans illustrating PCK elements. Instructional Approaches: Data indicating the use of specific teaching techniques tailored to the content.	Irrelevant PCK Information: Information unrelated to the integration of pedagogy and content. Examples include information unrelated to PCK integration and implementation in lesson plans. Non-Educational PCK: PCK unrelated to educational contexts.

Technological Pedagogical Knowledge (TPK)	Knowledge of how different technologies can be used in teaching to enable teachers to teach more effectively with technology	Knowledge on using Wiki as a communication tool to increase collaborative learning.	Effective Technology Integration: Data that demonstrates the teacher's ability to effectively integrate technology into pedagogical practices. Examples include lesson plans with TPK integration. Use of Educational Technology Tools: Data indicating the use of specific technology tools for instructional purposes.	Irrelevant TPK Information: Information unrelated to the integration of technology and pedagogy. Examples include non-educational TPK unrelated to educational contexts.
Technological Content Knowledge (TCK)	Knowledge about the manner in which technology and content are interrelated	Knowledge on how to use movie maker to present a report.	Technology's Role in Content Delivery: Data showing how technology is used to enhance the delivery of subject matter. Examples include evidence illustrating teacher's understanding and TCK integration in teaching. Software and Hardware Selection: Data indicating the choice of specific technology tools for content-related purposes.	Irrelevant TCK Information: Information unrelated to the role of technology in content delivery. Examples include non-educational TCK unrelated to educational contexts.

TPACK	Knowledge required to teach effectively with technology	Knowledge on using Wiki as a communication tool to increase collaborative learning in language concepts	Evidence of the Integration of TPK, PCK, and CK: Data showing the teacher's ability to integrate technological, pedagogical, and content knowledge effectively. For example, lesson plans, student feedback. Successful Application of TPACK: Data indicating successful teaching outcomes resulting from TPACK integration.	Irrelevant TPACK Information: Information unrelated to the integration of TPK, PCK, and CK. Examples include non-educational TPACK unrelated to educational contexts seen in teacher's practices or observed by students.

Framework for Teaching codebook

Code	Description	Example	Inclusion criteria and Examples	Exclusion criteria and Atypical exemplars
Domain I: Planning and Preparation				
PP1	Demonstrating Knowledge of Content and Pedagogy	Designing a lesson on a new concept with accurate scientific terms	Data that shows the teacher's deep understanding of the subject matter they are teaching.	Personal opinions or unrelated content knowledge.
		Designing a lesson on the main topic with primary source analysis	Data indicating the teacher's familiarity with effective teaching strategies and methods related to the subject.	Information not related to content or pedagogical knowledge.
		Building up on prior knowledge and skills in designing a series of new lessons	Examples: lesson plans, professional development records	Personal or hobby-related information
PP2	Demonstrating Knowledge of Students	Modifying assignments based on individual student needs	Data that provides insights into the teacher's understanding of individual students' backgrounds, needs, and abilities.	Data that only includes generic demographic information about students without insights into individual needs.
		Adapting a language lesson for students with special needs	Data that shows how the teacher plans to differentiate instruction to meet diverse student needs.	Information unrelated to the teacher's knowledge of their students.
		Modifying an ESL lesson to accommodate language learners with varying degree of prior English knowledge and skills	Examples: student feedback and individualised learning plan or other ways how a teacher provided personalised approach/ student-centred approach	Examples: students' social media or other un-related information to students

PP3	Setting Instructional Outcomes	Defining specific learning objectives for a lesson or for a unit	Data that outlines clear and measurable learning objectives for lessons.	Goals that are not related to instruction and learning outcomes.
		Setting clear learning goals in a lesson plan provides a clear direction for the teacher	Data indicating how the teacher's instructional outcomes align with curriculum standards.	Unrelated information to teaching and learning.
		Establishing clear learning goals for the lesson, e.g., By the end of the lesson, students will be able to have a basic conversation in English about their daily routines.	Examples include lesson plan objectives and evidence of teacher's knowledge of a school/ state curriculum and its links to the subject matter	Examples: any information unrelated to teaching and learning specifically in the domain of Planning and Preparation
PP4	Demonstrating Knowledge of Resources	Incorporating relevant educational materials into lessons	Data that shows how the teacher selects and plans to use instructional resources effectively.	Information about unrelated resources.
		Incorporating online simulations for a language lesson	Data indicating the availability and suitability of chosen resources for students.	Resources unrelated to the teaching context.
		Integrating realia into a language lesson	Examples include documentation on teacher's knowledge to access learning materials and how available those materials are	Examples: non-teaching Resources
PP5	Designing Coherent Instruction	Structuring lessons logically to build upon prior knowledge	Data that describes the organization and structure of lessons.	Information unrelated to lesson structure and strategies.
		Sequencing activities logically in a project-based lesson	Data that outlines the teaching methods and strategies used for effective instruction.	Information about unrelated organizational processes.

		Structuring a language lesson around a central theme linked to other subjects (science, for example)	Examples include lesson plan, teaching manuals.	Examples: unrelated to instructional strategies documentation
PP6	Designing Student Assessments	Creating quizzes and projects that align with learning objectives	Data that outlines how the teacher plans to assess student learning.	Information unrelated to student assessment.
		Crafting multiple-choice questions to assess verbal reasoning	Data showing how assessments align with instructional objectives.	Assessment data unrelated to educational contexts.
		Creating a rubric for evaluating persuasive essays	Examples include assessment rubrics and sample assessment documentation/ questions	Examples: non-educational assessment information.
Domain II: The Classroom Environment				
CE1	Creating an Environment of Respect and Rapport	Using positive language to communicate with students	Data that demonstrates positive interactions and relationships between the teacher and students.	Data unrelated to teacher-student interactions or respect and rapport.
		Establishing classroom norms for respectful communication	Data indicating respectful and effective communication within the classroom.	Interactions unrelated to the educational context.
		Implementing a peer recognition system for acts of kindness	Examples include observation notes and student feedback.	Examples: personal chat messages with elements of bullying language that could hurt others' feelings or language of direct physical harm.
CE2	Establishing a Culture for Learning	Encouraging students to share their own cultural stories	Data that describes the classroom's culture, emphasizing its focus on learning.	Information unrelated to the classroom culture for learning.

		Encouraging students to ask questions and explore new ideas	Data that highlights students' active engagement in the learning process.	Information about cultural aspects unrelated to education.
		Encouraging peer feedback as a valuable part of the learning process	Exzamples include classroom observation notes and student feedback notes.	Examples: non-educational culture; student personal chat history
CE3	Managing Classroom Procedures	Implementing a routine for handing in assignments	Data that outlines classroom procedures and routines.	Information unrelated to classroom procedures.
		Organizing routines for smooth transitions between activities	Data demonstrating the effective management of classroom procedures.	Information unrelated to educational settings.
		Teaching students how to self-check their understanding	Examples include teacher observation records or classroom procedure manuals.	Examples: non-procedural or non-educational information that does not explain the definition.
CE4	Managing Student Behavior	Applying a progressive discipline approach to address behaviors	Data indicating how the teacher manages student behavior effectively.	Information unrelated to classroom behavior management.
		Using a behavior chart that allows students to track their progress	Data showing how the teacher resolves conflicts among students.	Information about personal behavior unrelated to the classroom.
		Applying a positive behavior reinforcement system	Examples include behaviour management plans or any record on incidents in student behaviour.	Examples: irrelevant student behaviour information.
CE5	Organizing Physical Space	Arranging desks to facilitate group discussions and activities	Data that describes the organization and arrangement of the physical classroom space.	Information unrelated to classroom organization.

		Creating a cozy reading nook in a corner of the classroom	Data indicating how the physical space is designed to accommodate diverse student needs.	Information about non-educational spaces.

Appendix I: Joint display with teacher responses from primary and secondary schools

Hungary

Children

'…a substitute math teacher gave us work, but she didn't explain anything. So I had to look it up on YouTube. And there were some teachers that explained the same thing just on a video, and that helped me to understand. And then there's also the book but I don't always understand that'

TP= 3.91
SP= 3.50
CP= 3.70

Parents

'I have full trust in my son because from the first class we agreed that he will do his best and it worked in the last eight years. His GPA was 4.5.. He didn't have any difficulties with learning and that is why I never had to ask crazy things from him. We speak about important things, What is the highlight of the day? I don't have to ask that, 'Is it really 5 or 4? Or do you have a 2 or 1 (grades)?'

38 years old

Teacher

'While I am teaching my lesson I usually share my computer screen. And in this way students can make notes about the lesson. And what is important or what I'm sure that they will need later I always upload in Google Classroom'"

6 years of teaching experience

EdTech expert

40 years old

'… teachers started to use EdTech as simple as the table and the pan in classic schools. They know how to let the children in into the classroom and how to start and finish the class. But they don't use the real benefits of the softwares right now. So as I understand all of those technologies they are using in today support them, but they are not open or they don't have time or they are not interesting to use it as it supposed to be…Most of teachers use EdTech for a frontal teaching process…we are at the beginning of the digitalization and we have to teach the teachers how to use the modern technology'

Kazakhstan

Children

‘many of my classmates use answers from the textbook, they found a website in Google…they copy the answers and write it down in a notebook. And their homework is done’

‘All of a sudden our physical education lessons ended…we just watched and listened to it via WhatsApp, that’s it’

TP= 3.82 SP= 3.51 CP= 3.61

TP= 3.82 SP= 3.51 CP= 3.61

Parents

This distance learning was really difficult from the very beginning. At the beginning we were like crazy, I was yelling everytime at my kids, ‘Why don't you understand? Why did you not do that? Or why did you attach that? Why did you press that button? You know it was something weird and I know that I was not the only parent who was yelling at their kids

35 years old

Te er

‘We stream the lesson via Google Meet. We use Power Point presentations…Let's say we have The World Around Us unit, we can switch to Google map. Students already perceive this as the main technology…we can explore different areas on Google map”

6 years of teaching experience

EdTech expert

We have a learning loss because of two reasons. First is the digital divide. We do not have access to technologies, many families lack proper space and conditions for learning. Second is lack of pedagogical knowledge among teachers.

40 years old

Poland

Children

‘I text my friends and sometimes call them. We’re on Snapchat or messenger…but it is hard to keep in touch online. The circle I prefer to meet with my friends and see face-to-face and go eat somewhere’

TP= 3.82
SP= 3.51
CP= 3.61

‘Once a month we used Kahoot! for quizzes but the most engaging was funny videos from the teacher on Wednesdays and the whole class was waiting for Wednesday. There was also a teacher who provided a web page with repetition studies and there were discrepancies between what we learned and what was written. The web page was not professional. What worked well and we continued to use it was a collaborative page. Students who missed lessons could refer to this page to refresh the content of the previous lesson. It was my idea first and then my classmate advanced the idea

Parents

“So we gave our children freedom. But especially with the older kids, my impression is that if you don't give them freedom, they rebell, they would be very unhappy. And on the other hand, they need control. So I don't, you have to be very careful to find the balance”

45 years old

Teacher

‘I'm from the generation that has some problems with technologies…So it took me some time to get used to it….I was actually abroad in a training for teachers where they showed us many applications, many methods that we could use to motivate students, to make the learning more interesting, to make them learn English’

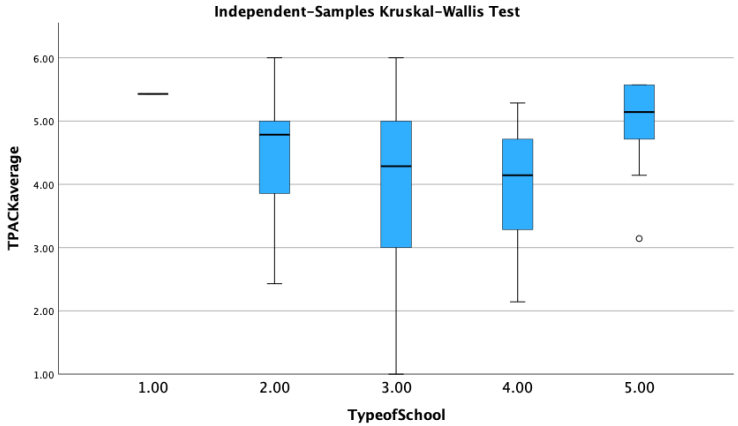
58 years old

EdTech expert

‘After school activities is huge between all the teenagers. They are coming home or even on the way to home, they are using, applications like Tick Tock or YouTube or playing popular games. So they are all the time, I can say, immersed in this technology. So when we are starting to use the technology also during the lessons, we need to prepare some content to work with them in meeting their requirements, that's my opinion’.

40 years old

Appendix J meta-inference at a teacher-oriented level

<table>
<tr><th colspan="3">Teacher-centred level</th></tr>
<tr><td>Quantitative scores showing a mean value of teachers' TPACK score across case studies that differed significantly in teacher demographic variables</td><td>Qualitative findings based on interviews with teachers across cases from primary and secondary schools</td><td>Interpretation of teachers' practices of technology integration based on teachers' pedagogic orientation in using technology</td></tr>
<tr><td>The distribution of TPACK average is significantly different across types of schools. In TypesofSchool axis 1.00 corresponds with kindergarten, 2.00 with primary school, 3.00 with secondary school, 4.00 with high school, and 5.00 with Others. A mean value of TPACK score across cases was significant between 3.00 and 5.00. However, there were mainly teachers from secondary schools and a few language teachers from primary schools in this study across cases. Therefore, the interpretation column represents the integrated study findings as interpreted by the author of this study.
 
</td><td>Evidence of teachers' technology integration with pedagogy and content.
"Technologies like screen recorder helped us to record our video lessons for those students who for some reason were absent during the lessons and we could completely record our lesson by inserting video files and audio files" (Teacher 3, Kazakhstan, primary school)
"Using videoconferencing has substituted in person teaching completely. I have been using to some extent Kahoot! and Word Wall and learning apps and Redmenta. All these platforms where you can create tasks. To tell you the truth, I ended up avoiding them even with the high schoolers. Because…when you create a task from scratch to tailor it to the individual needs of your students, it's so much time that with the amount of teaching of 26 lessons in the high school,I just did not have enough time to do those. (Teacher 3, Hungary, secondary school)</td><td>Analysing qualitative findings with teachers from primary and secondary schools, there were differences observed in teachers' statements toward technology integration with pedagogy in online learning environments during the pandemic. Some of the aspects that may explain why primary school teachers were more open toward integrating technology with pedagogy beyond instruction planning or preparing students for exams include the following:
1) Teachers' workload. Language teachers in primary schools had fewer contact hours of English with learners in comparison to their peers from secondary schools in the sample of teachers in this study. Teachers' workload in participants' degree in integrating technologies to teach higher order thinking skills, to practice 21-st century skills, to promote digital literacy.
2) Influence of external factors. Primary teachers in the sample of teachers in this study talked at length about continuous school support before and during the pandemic on upgrading teachers' technological knowledge. Although primary teachers recognised lack of teachers' technological and technological</td></tr>
</table>

		pedagogical knowledge in hindering their abilities to utilise technologies in supporting student learning, their responses were notably different from their peers from secondary schools across case studies. External factors, often documented by other scholars before and during the pandemic, on teachers' limited use of technology integration in teaching practices in online learning environment have been voiced by all study participants in this study. These factors included lack of school support, lack of policies informing technology integration, and the digital divide. However, teachers from secondary schools expressed that their schools expected teachers to know how to use technologies in teaching during ERE and did not provide any institutional support.

Appendix K meta-inference at a student level

<table>
<tr><th colspan="3">Student-centred level</th></tr>
<tr><td>Quantitative scores showing a relationship between teaching presence, social presence, and cognitive presence as self-reported by students aged 10-18 in this study. Community of Inquiry questionnaire was used for 158 students from public secondary schools across case studies</td><td>Qualitative findings based on interviews with students across cases from secondary schools on their perceptions of online learning during an emergent remote education in Hungary, Kazakhstan, and Poland</td><td>Interpretation</td></tr>
<tr><td>There was no statistical correlation between social presence and teaching presence but cognitive presence and the associations between teaching presence and social presence were significant. It may be implied that cognitive presence might facilitate the enhancement of both teaching presence and social presence in online learning for learners aged 10-18.

Pearson’s Correlation Table for the Student Sample Across Countries
<table>
<tr><td></td><td>1</td><td>2</td><td>3</td></tr>
<tr><td>1. Teaching Presence</td><td>1</td><td></td><td></td></tr>
<tr><td>2. Social Presence</td><td>.275**</td><td>1</td><td></td></tr>
<tr><td>3. Cognitive Presence</td><td>.561**</td><td>.526**</td><td>1</td></tr>
<tr><td>N</td><td>159</td><td>159</td><td>159</td></tr>
</table>
** p < .001</td><td>‘We use Google Meet and then teacher usually shares her screen and she also gives us links in the chat and we press on it and we usually play some games like Kahoot! or Quizzes. And yes, she gives us a link and we just press an image and type in our names and we play. So it's pretty easy’ (Student 1, Hungary)

‘We study through Google Meet and if someone has questions, they text the teacher on WhatsApp and in a comment in the Google Classroom’ (Student 1, Kazakhstan)

‘When I think about [online learning during the pandemic] I feel like I was doing nothing. I was sitting in my room, switching on the computer, listening to someone talking from the computer. And I don't remember anything from that. And I am feeling like I was doing nothing the whole year or half’ (Student 2, Poland).</td><td>Based on students’ interview responses and teachers’ descriptions of how they organised online learning it can be deducted that teaching presence was mainly established in setting assignments, giving instructions, and organising activities. Teaching presence related to students’ evaluation of the quality of their educational experiences was not implemented. Additionally, student interview responses show that in their age group 10-18 teachers did not demonstrate elements of the cognitive presence and social presence. For instance, students reflected in interviews on lacking open communication with peers and teaches, assignments encouraging students’ problem-solving skills, critical thinking skills, and reflective thinking skills.
Integrating quantitative results and qualitative findings of students’ perceptions of online learning demonstrated data convergence.</td></tr>
</table>

Appendix L: Informed Signature(s) for Consent

I give permission for my child to participate in the research project which aims to explore and understand teachers' and families' roles in supporting students' learning and inquiring about teachers' student-oriented pedagogies with the help of educational technology. I understand that, in order to participate in this study, my child must also agree to participate. I also understand that, in order for my child to participate in the study, they should also give their consent. I understand that, at any point of the research process, my child and I can change our minds and we can withdraw from the study without bearing any penalty.

Child's signature_____
Age:

_____
Parent/ Guardian's signature:

_____
Date:

_____

Informed Consent and Description of Research (online study)

The role of teachers and families in supporting students' learning and maximizing teacher effectivenes: a case study in secondary schools

You are to participate in a research coordinated by Varga Attila, PhD. The research is carried out by highly qualified pedagogues and his assistant, Assel Stambekova. The aim of this study is to explore and understand teachers' and families' roles in in supporting students' learning and inquiring about teachers' student-oriented pedagogies with the help of educational technology.

Participation is utterly voluntary. There will be a questionnaire to fill out anonymously. Then you will be requested to participate voluntarily in a 45-60 minute online interview via Zoom. The interview will have between 5-10 broad questions with some follow-up questions. The interview will happen in a language that you feel most comfortable to speak in: English, Hungarian, Kazakh, or Russian. With your permission, the interview will be audio recorded and note-taken for the research purpose. Your personal information will not be identified and pseudonyms will be used in all phases of the study, in all field notes, computer files and all project texts including the final thesis or article publication. Additionally, a few of remote English lessons will be observed after your permission. Performing the various tasks is harmless without any detrimental after-effects. It is possible to suspend participation so that it should not be tiresome. It is also possible to terminate participation at any time and to decline from answering questions without having to give reasons for this. Monetary compensation is **not due** for participation.

Data will be collected anonymously during the study and no other personal data will be obtained either.

The results of this study will later be used in publications and will also be presented at scientific conferences. If requested, written or verbal information will be provided on these events.

All information (voice recorded interviews, research notes, classroom observation notes) collected during this process will be handled strictly confidentially. Data obtained during the research is stored as a coded information in a secured computer and kept in a locked chest also in a coded format. The individual code, provided by the assistant in charge and accessible, is known only to her. Data of the research are analyzed statistically during which no personal identification is possible. The document with the rules regulating personal data processing (General Data Protection Regulation, GDPR) is attached with its enclosures.

Verbal account can be provided about the findings upon request.

I…… (undersigned) declare that I was given thorough information regarding the circumstances of my participation in the present research. I agree with the conditions and to participate in the study. I also give my consent to use the anonymized data collected during this process so that these may be accessible to other researchers. I reserve the right to terminate my participation at any time in which case the data belonging to my person should be erased.

I am not (and have not been) treated for any kind of neurological or mental disease.

ELTE FEP Stambekova Assel as data processor handles my above personal data confidentially and does not allow access to these for other data processing or data analyzing organizations of any kind. Details of this statement are found in the "Information of Processing of Data (GDPR) which I agree with as proven by my signature.

I read the "Agreement to Data Processing" document and

O I agree and accept O I do not agree, do not accept

By proceeding you agree that data collected on your person - which cannot be identified as those belonging to your person - may be used for research purposes and that these will be accessible to other researchers.

I declare that I am over 18 years of age. I have received full detailed information concerning the conditions of my participation of the study. I agree with these conditions and I am willing to participate.

O yes O no

Appendix M: TPACK analysis

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The distribution of TPACKaverage is the same across categories of INSTN.	Independent-Samples Kruskal-Wallis Test	.027	Reject the null hypothesis.

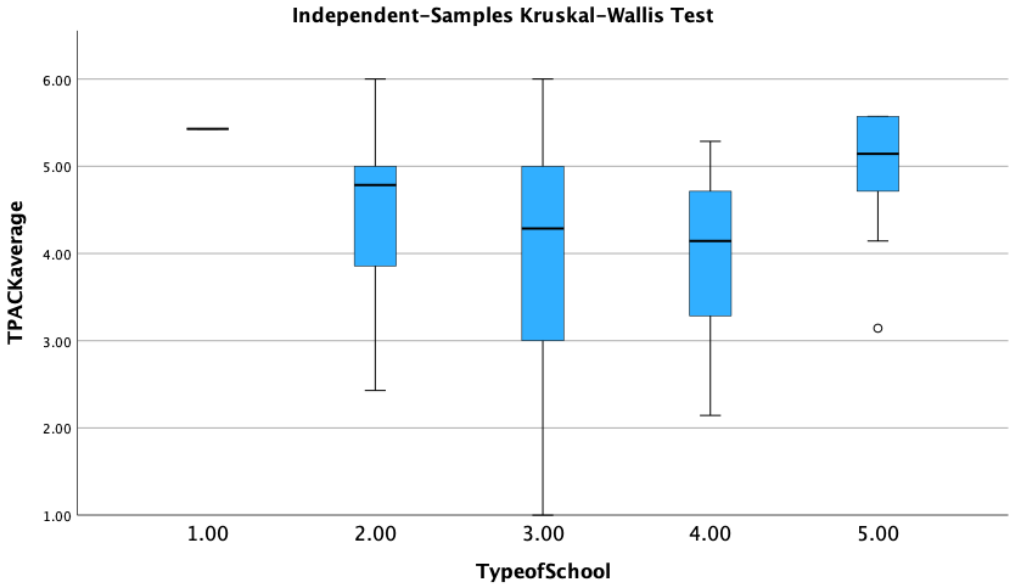
a. The significance level is .050.

b. Asymptotic significance is displayed.

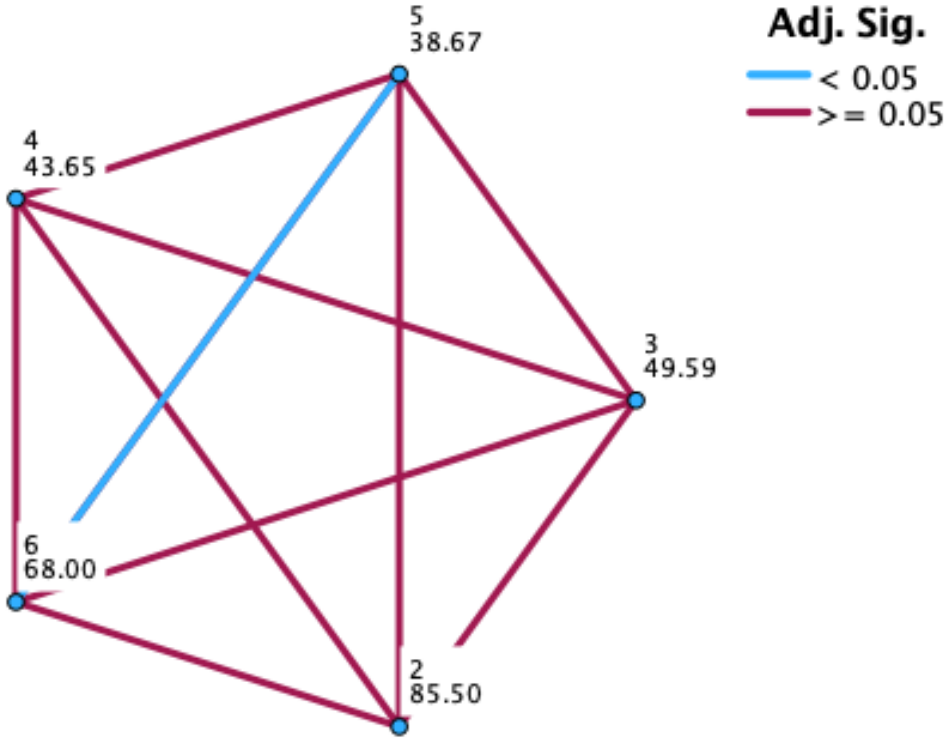
Independent-Samples Kruskal-Wallis Test Summary

Total N	93
Test Statistic	10.953[a]
Degree Of Freedom	4
Asymptotic Sig.(2-sided test)	.027

a. The test statistic is adjusted for ties.



Pairwise Comparisons of INSTN



Each node shows the sample average rank of INSTN.

Appendix N: Observation report of a remote EFL lesson

The Framework for Teaching Evaluation Instrument, 2013 Instructionally Focused Edition, Charlotte Danielson (2013)

Classroom Observational Tool

Adapted for the research study

Observation 1: March 25th, 2021

Remote teacher: Hungarian teacher

School in Hungary, grade: 12

Topic: Speaking practice for the exam

Notes: lesson officially starts at 8.40 local time. Teacher and some students connected at 8.35 and teacher started interacting with five present students. Students had their cameras off. Teacher 1, Hungary is a classroom teacher who has to teach online because of school closures. Two students were communicating with the teacher telling if their cameras were not working or sharing some other tech issues.

The teacher was asking students about other students, if they know where they were or if they were coming.

Remote teacher started at 8.44 announcing plans for today's lesson- Reading task with one group. At 8.46 there were eight student; the teacher shared her screen, a page from the textbook. The teacher started the lesson by asking students if they get regular medical check-ups? This question was also visible on the page of the textbook. Students were consistent speaking Hungarian to the teacher and the teacher at some point brought up the importance of speaking English. The teacher emphasised that these classes are designed to practise English so they can be ready for a final exam in June. After that two students spoke English answering teacher's question "Do you lead a healthy lifestyle?".

One student was answering without turning on her camera in English, another student was speaking in Hungarian.

At 9.20- 9.253 two students role-played a dialogue practicing Health language. After the dialogue the teacher thanked students and the teacher asked what additional questions students may have asked each other. The teacher also reminded students that they and their colleague will be at the exam and they are expecting students to ask as many questions as possible during a dialogue act-out.

At 9.30 there was a 10-min break.

The lesson started at 9.40.

One student was answering teacher's questions in English.

At 9.54 teacher shared speaking task with students and students tool turns answering speaking tasks (see below)

Task 2 Role-play

You and your friend are overweight and want to lose weight together. You visit a specialist (your examiner). Tell the specialist how you want to lose weight and discuss why you've chosen this particular way. Here are some ideas as to how to lose weight:

go on a diet

take diet pills

go to a gym to keep fit

go to a health clinic

Your examiner starts: *'How can I help you?'*

Task 3 Talk

Which of the following is the best to do if you have the flu? These pictures show three different ways to deal with the flu. Compare and contrast them. Include the following points:

Part 3. Individual long turn

These pictures show two completely different lifestyles. Please compare and contrast them using the following points:

- How do these lifestyles differ?
- Why are sports important?
- How can you protect your health?
- Why is smoking unhealthy?

At 10.02 another student started answering speaking task individually demonstrating B2 level.

Part 3. Individual long turn

These pictures show different types of food, compare and contrast them using the following prompts:

- **What makes a food unhealthy or healthy?**
- **What is a balanced diet?**
- **Which is better: home-made food or fast food?**
- **Why are organic ingredients getting more and more popular?**

Students were using mic to chat with the teacher in L1, Hungarian.

Teacher announced all instructions verbally. Students were communicating with the teacher using their mics. Communication went in Hungarian and occasionally in English.

By the end of the lesson there were eight students.

ELEMENT	DOMAIN 2: THE CLASSROOM ENVIRONMENT Component 2a: Creating An Environment Of Respect And Rapport LEVEL OF PERFORMANCE			
	UNSATISFACTORY	BASIC	PROFICIENT	DISTINGUISHED
Teacher interaction with students		x		
Student interaction with other students	x			
	Component 2b: Establishing a Culture for Learning			
Importance of the content and of learning		x		
Expectations for learning and achievement		x		
Student pride in work		x		
	Component 2c: Managing Classroom Procedures			
Management of instructional groups		x		
Management of transitions		x		
Management of materials and supplies			x	
Performance of classroom routines		x		
	Component 2d: Managing Student Behavior			
Expectations	N/A			
Monitoring of student behavior		x		
Response to student misbehavior	N/A			
	Component 2e: Organizing Physical Space			
Safety and accessibility		x		
Arrangement of furniture and use of physical resources- not relevant				
	DOMAIN 3: INSTRUCTION			
	Component 3a: Communicating with Students			

Expectations for learning		x		
Directions for activities		x		
Explanations of content		x		
Use of oral and written language		x		
	Component 3b: Using Questioning and Discussion Techniques			
Quality of questions/prompts		x		
Discussion techniques		x		
Student participation		x		
	Component 3c: Engaging Students in Learning			
Activities and assignments			x	
Grouping of students	Students worked with the teacher& individually			
Instructional materials and resources			x	
Structure and pacing		x		
	Component 3d: Using Assessment in Instruction			
Assessment criteria		x		
Monitoring of student learning		x		
Feedback to students		x		
Student self-assessment and monitoring of progress	X (wasn't present)			
	Component 3e: Demonstrating Flexibility and Responsiveness			
Lesson adjustment		x		
Response to students			x	
Persistence			x	

Example: Observation report of a remote EFL lesson conducted by one of the Kazakhstani teachers in March 2020

The Framework for Teaching Evaluation Instrument, 2013 Instructionally Focused Edition, Charlotte Danielson

Classroom Observational Tool

Adapted for the research study

Observation 1: March 5th 2021

Remote teacher: Teacher, Kazakhstan

School in Kazakhstan, grade: 7

Topic: Future arrangements

Notes: lesson officially starts at 17.05 local time. Teacher and some students connected at 17.00 and teacher started interacting with four present students. Students had their cameras off. Remote teacher also had her colleague, classroom teacher A., present. Two students turned on their students at 17.07.

Remote teacher used IWB Promethean software and its various functions (e.g. annotate, changing colours to attract students' attention and to indicate new target language, to announce instructions in written form while announcing them verbally).

By the end of the lesson there were six students.

ELEMENT	**DOMAIN 2: THE CLASSROOM ENVIRONMENT** **Component 2a: Creating An Environment Of Respect And Rapport** LEVEL OF PERFORMANCE			
	UNSATISFACTORY	BASIC	PROFICIENT	DISTINGUISHED
Teacher interaction with students		x		
Student interaction with other students	x			
	Component 2b: Establishing a Culture for Learning			
Importance of the content and of learning		x		
Expectations for learning and achievement				
Student pride in work		x		
	Component 2c: Managing Classroom Procedures			

Management of instructional groups		x		
Management of transitions		x		
Management of materials and supplies		x		
Performance of classroom routines				
	Component 2d: Managing Student Behavior			
Expectations			x	
Monitoring of student behavior		x		
Response to student misbehavior	N/A			
	Component 2e: Organizing Physical Space			
Safety and accessibility		x		
Arrangement of furniture and use of physical resources- **not relevant**				
	DOMAIN 3: INSTRUCTION			
	Component 3a: Communicating with Students			
Expectations for learning	**x**			
Directions for activities		**x**		
Explanations of content		**x**		
Use of oral and written language			**x**	
	Component 3b: Using Questioning and Discussion Techniques			
Quality of questions/prompts		**x**		
Discussion techniques		**x**		
Student participation		**x**		
	Component 3c: Engaging Students in Learning			
Activities and assignments		**x**		
Grouping of students	**Students worked with the teacher**			
Instructional materials and resources		**x**		

Structure and pacing		**x**		
	Component 3d: Using Assessment in Instruction			
Assessment criteria				
Monitoring of student learning		**x**		
Feedback to students		**x**		
Student self-assessment and monitoring of progress	**X (wasn't present)**			
	Component 3e: Demonstrating Flexibility and Responsiveness			
Lesson adjustment		**x**		
Response to students		**x**		
Persistence		**xx**		