Pre-service Teachers' Adaptability to Disruptive Technologies in English as a Foreign Language Education

Adaptabilidad de los Docentes en Formación a las Tecnologías Disruptivas en la Enseñanza del Inglés como Lengua Extranjera

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ABSTRACT

Disruptive technologies encompass a range of technological advances that have the potential to challenge established methods and practices. In the context of English as a Foreign Language (EFL), the use of these technologies offers the possibility of addressing students' needs by placing them at the center of knowledge creation, while also providing teachers the opportunity to adapt to the digital environment by learning and applying new digital tools. The purpose of this study is to identify and characterize the adaptability of EFL pre-service teachers to disruptive technologies in their pedagogical practice, through an analysis of the key areas of their graduate profile. This descriptive, quantitative research aims to collect measurable data for statistical analysis from a sample group. The study involved seven participants aged 22 to 25 years. A four-point Likert scale with 40 items was used to assess the seven evaluations of each participant's lesson plans and classroom performance, yielding a total of 49 evaluations. The results demonstrated a gradual inclusion and integration of four fundamental dimensions—EFL competence, EFL teaching and learning, adequacy of the learning environment, and the integration of disruptive technologies in EFL—ensuring the development of digital teaching competencies. The study concluded that the traditional model of EFL teacher education, which emphasizes professional experience, tends to marginalize technological knowledge in pedagogical practice. As a result, this disconnect represents an area of opportunity for innovation in ILE teacher education.

KEYWORDS: Disruptive Technologies, Collaborative Learning, Online Education, Educational Technology, Teacher Training, Learning Strategies.

RESUMEN

Las tecnologías disruptivas son una variedad de avances tecnológicos que tienen el potencial de desafiar los métodos y prácticas establecidos. En inglés como lengua extranjera (ILE), el impacto del uso de estas tecnologías implica abordar las necesidades del estudiantado otorgándoles un papel central en la creación de conocimiento, y también implica la oportunidad para el profesorado de integrarse en el entorno digital aprendiendo a utilizar y aplicar las nuevas herramientas digitales. Este estudio tiene como propósito identificar y caracterizar la adaptabilidad a las tecnologías disruptivas de profesores en formación de ILE en su práctica pedagógica a través de la descripción de las áreas de realización de su perfil de egreso. Esta investigación descriptiva es de tipo cuantitativa y pretende recopilar datos medibles para el análisis estadístico de una muestra. El estudio contó con siete participantes cuyas edades oscilaron entre 22 y 25 años. Se utilizó una escala Likert de cuatro puntos con 40 ítems para codificar los resultados obtenidos en las siete evaluaciones de los planes de clase y las actuaciones en el aula de cada participante, obteniendo un total de 49 evaluaciones realizadas. Los resultados mostraron

una progresiva inclusión e integración de cuatro dimensiones fundamentales (competencia en ILE, enseñanza y aprendizaje de ILE, adecuación del entorno de aprendizaje e integración de tecnologías disruptivas en ILE) para garantizar el desarrollo de las competencias digitales docentes. Se concluyó que el modelo tradicional de formación del profesorado de ILE que construye experiencia profesional genera que el conocimiento tecnológico sea dejado de lado en la práctica pedagógica. Por lo tanto, esta ruptura formativa representa un área de oportunidad para la formación de profesorado del ILE.

KEYWORDS: Tecnologías disruptivas, Aprendizaje colaborativo, Educación en línea, Tecnología educativa, Formación del profesorado, Estrategias de aprendizaje.

INTRODUCTION

Disruptive technologies are characterized by their ability to disrupt traditional practices, usually starting with a small group of users, but eventually gaining ground to replace previous technologies that were dominant in their field. Disruptive innovation in technology is based on the growing popularity of collaborative tools that encourage the preparation that leads to innovation (Xiang et al., 2023). This, in turn, leads to the implementation of novel teaching strategies aimed at stimulating students' skills, thus contributing to the improvement of their professional development (Rojas-Alfaro & Montenegro-Sánchez, 2024). In other words, disruptive technologies are revolutionizing the way teaching and learning take place, offering new opportunities for the development of skills and competencies in students, and ultimately transforming the educational process (Zambrano & Meza, 2022).

Disruptive technologies are a variety of technological advances that have the potential to challenge established methods and practices. They include the Internet of Things, big data, machine learning, migration to the cloud, edge computing, artificial intelligence (AI), robotics, and 5G. In EFL teaching, disruptive technologies include video and audio streaming (e.g., Post casting, YouTube, Twitch, etc.) (Glas et al., 2021), instant automatic translators, language learning apps with speech and writing recognition (e.g., Google Translate, SpeakingPal, Speechmatics, etc.) (Rosell-Aguilar, 2017), social networks (e.g., X, WhatsApp, Instagram, Telegram, etc.), online platforms (e.g., Babbel, Busuu, BrainPOP, Edmodo, etc.) (Rojas-Alfaro & Montenegro-Sánchez, 2024), video games (game-based learning) (e.g., Minecraft, Doulingo, Quizlet, etc.) (Purgina et al., 2020), virtual reality (e.g., Immerse VR, Rumii, VirtualSpeech, etc.), augmented reality (e.g., Blippar, mondly, QuiverVision, among others) (Rojas-Alfaro & Montenegro-Sánchez, 2024), chatbots (e.g., Doulingo Chatbot, Andy English Bot, etc.) (Mennella, & Quadros-Mennella, 2024), assessment systems with automatic correction (e.g., Blackboard, Canvas LMS, Moodle, etc.), electronic whiteboards (Samsung WAD Interactive Display, Promethean Board, among many others.) (Wyatt-Smith et al., 2021).

Technological transformations and advancements in the field of education have sparked significant debate in recent years, as they have prompted educational systems worldwide to reflect on concepts

such as crisis, instability, and uncertainty. However, these developments are also closely linked to the ideas of progress and development (García-Morales et al., 2021; Shenkoya & Kim, 2023). This is particularly evident in their applicability to the educational sector, where there is a clear potential for their implementation and development, as well as an emerging area of opportunity (Ocaña-Fernández et al., 2020). In this context, the COVID-19 pandemic represented a critical turning point, offering a unique opportunity for research from a variety of perspectives and approaches aimed at fostering the transformation of education (Mérida-Martínez & Acuña-Gamboa, 2023).

Despite the restrictions and concerns surrounding the risk of contracting COVID-19, both students and teachers demonstrated remarkable resilience in overcoming these challenges and continuing the teaching-learning process. Teachers, for instance, employed creative strategies, including the use of technology, to maintain effective communication with their students (Glas et al., 2021). These collaborative efforts played a crucial role in ensuring the continuity of education under difficult circumstances (Vallejos & Guevara, 2021; Gandolfi et al., 2021).

In particular, the abrupt change in the conventional way of delivering education represents a turning point that has triggered a profound revision of the methods of managing the student learning process. This moment of change has become a crucial catalyst for a comprehensive re-evaluation of how education, and of course teacher education, is approached, as suggested in Vallejos & Guevara (2021).

Technology-mediated teaching is not a new practice in EFL settings. Before the arrival of the pandemic, virtual or technology-enhanced education was barely present or almost non-existent (De Vries & Grijalva, 2023). Mirete (2010) highlighted that there is still a long way to go and considerable efforts to be made before the benefits of digital media can be fully exploited. These include stimulating motivation and innovation in the educational environment, as well as the formative and communicative aspects. For this reason, "the digitization of the social environment has represented an involuntary and forced challenge for the educational community, which has been forced to face the changes brought about by the diffusion of COVID-19" (Casimiro-Perlaza & Torres-Daza, 2023, p. 177).

In this context, De Vries and Grijalva (2023) highlight that virtual or technology-mediated education offers several significant advantages for managing academic courses. These advantages include the ability to organize and distribute content and materials more efficiently, enhanced monitoring of potential plagiarism, the provision of detailed feedback and effective evaluation of student work, the creation of educational evidence portfolios, and the precise recording of both partial and final grades.

The use of technologies in education requires considering students' needs by placing them at the center of knowledge creation. It also presents an opportunity for EFL teachers to immerse themselves in the digital environment, learning to use and apply new digital tools (Zhang, 2022). This shift involves moving beyond the mere use of technology to the creation of educational content, with the aim of fostering this approach among the students themselves (Parra, 2022).

Technology in education promotes greater competitiveness and adaptability, especially in the digital realm, as pointed out by Flores-González (2022):

> The use of technology in education has innumerable advantages and, above all, allows for a transformation of teaching practice, whenever it promotes competitiveness and adaptability in the field. For this reason, there is a tendency to develop sustainable and adaptable competences that require the use of the digital or virtual environment. (p. 101)

In the above, two types of essential competencies stand out that teachers must possess when integrating digital content and virtual platforms as part of their adaptation to contemporary educational environments, as emphasized in Flores-Gonzalez (2022). First, there are pedagogical competencies, which include the ability to design, implement, and manage effective learning experiences for students. Second, technical skills are needed to enable them to use and leverage digital tools efficiently. The combination of these pedagogical and technical competencies is fundamental to creating authentic and contextualized learning contexts (Zhang, 2022).

The former highlights the need for teachers to develop both pedagogical and technological literacies in order to adapt to contemporary educational environments. Technology in is seen as a key driver of competitiveness and adaptability, particularly in the digital realm (Flores-González, 2022; Ocaña-Fernández et al., 2020; Parra, 2022; Vallejos & Guevara, 2021).

Therefore, the following research question is posed: How adaptable are EFL pre-service teachers to disruptive technologies in their pedagogical practice? To this end, we intend to characterize the adaptability to disruptive technologies of EFL pre-service teachers through the description of the areas of realization of their graduate profile.

This article is structured as follows: The second section provides background on education, disruptive technologies, and the transformation of English as a foreign language teaching practices. The third section outlines the methodology used in this study. The fourth section presents the key findings and their implications, focusing on four dimensions: EFL proficiency, the EFL teaching and learning process, the adequacy of the learning environment, and the integration of disruptive technologies in EFL teaching and learning. The fifth section offers conclusions and suggestions for future research.

Theoretical foundation

Education and disruptive technologies

With the COVID-19 pandemic, traditional or face-to-face education has undergone a significant change in the way it is delivered. Prior to this historic moment for humanity, education focused primarily on presenting notes and texts to students as the primary method of teaching. However, with the pandemic, a variety of additional media and activities had to be introduced to support the learning process. This change was not limited or restricted to the simple inclusion of audiovisual media such

as videos or presentations. On the contrary, given the need, the incorporation of new technologies in the educational environment has been promoted, such as: online platforms, educational applications, videoconferencing, the implementation of mobile devices, among other technological tools, causing a transformation in teaching methods and the organization of learning processes.

However, some teachers may struggle to update their teaching approaches and may be reluctant to integrate advanced technologies into their teaching. This reluctance may stem from a preference for traditional methods, a lack of knowledge about new technologies, or resistance to change (Casimiro-Perlaza & Torres-Daza, 2023). With the disruptive changes of technologies, some teachers generate conflicts with technological processes, who do not want to update their traditional teaching method, but stay on track their traditional model where it becomes difficult to apply active methodologies and not to insert disruptive technologies in the virtual classroom (Zambrano & Meza, 2022). The integration of disruptive technologies can potentially contribute to facilitate transformation of EFL teaching and learning approaches, offering a personalized experience in EFL teaching and learning (Talukder, 2023).

Likewise, technology and disruptive innovations are supported by the increased use of collaborative tools. These tools are designed to encourage collaboration and interaction among those who use them. As a result of this collaboration, new and innovative ideas are generated and learning strategies different from traditional ones are developed.

Zambrano and Meza (2022), emphasize the importance of disruptive technologies in education because they can revolutionize the way teaching and learning takes place by making the process more accessible, collaborative, and innovative, which in turn improves student learning. In this regard, Gallardo et al. (2020) highlight that the use of technological devices in education can lead to a significant improvement in the acquisition of knowledge and, consequently, in the academic performance of students, which is perceived as a positive and beneficial outcome.

In this context, disruptive technologies are those that radically alter established practices within a field. Initially adopted by a limited number of users, they eventually replace previously dominant technologies. These disruptive technologies are characterized by being cheaper, smaller, and easier to implement across various environments, whether commercial or educational (Zambrano & Meza, 2022). The aim of this innovation is to enhance and stimulate students' learning capacity. In other words, the goal is for students to acquire skills and knowledge more effectively, making their education more enriching and effective through collaboration and technology-driven innovation.

Transforming the teaching practice of english as a foreign language

From an epistemological perspective, teaching practice is characterized as a series of planned activities in a particular institutional environment, influenced by the curriculum and training criteria. In Chile, an interest has been observed in transforming EFL teacher education, moving from the theoretical to the

practical, emphasizing language skills and foreign language teaching methodology to meet accreditation requirements (Barahona, 2016; Martel, 2020; Martin & Rosas-Maldonado, 2019; Porto et al., 2021).

In this sense, the widespread adoption of digital technology is a viable option for improving the practical performance of EFL teachers. In order to implement these pedagogical changes, it is necessary for EFL teachers to acquire a comprehensive knowledge of digital literacy and how it can be used in language teaching. This encompasses not only technical skills, but also an understanding of how digital tools can support different teaching styles (Rojas-Alfaro & Montenegro-Sánchez, 2024). It also requires teachers to adopt a growth mindset, to be willing to try new things and to learn from both successes and failures. This allows EFL teachers to devote more time and effort to innovating course content, exploring educational technology, updating teaching approaches, and focusing on the individual development of their students (Zou & Wang, 2024).

For Donovan et al. (2011), anticipation of opportunities fosters greater interest in integrating technology into education. Technology changes the way teachers and students relate to one another and their roles in education. Digital technology also offers new possibilities in terms of education and training strategies. On the one hand, it facilitates self-learning and research by providing access to a wide range of digital educational resources. On the other hand, digital tools allow for the application of more dynamic and interactive strategies in the classroom. Through collaborative platforms, virtual simulations and multimedia projects, students can become more actively involved in their learning process. Teachers also have a wide variety of digital resources to enrich their teaching and adapt it to the specific needs of each student (Alshammari et al., 2018).

The integration of technology in education not only changes the way knowledge is taught, but also fosters the growth of essential 21st century skills such as critical thinking, problem solving, and digital literacy (Zhang, 2022). Currently, there is a need for a teacher education approach that promotes the integration of technological and pedagogical knowledge from the outset, following current educational and policy demands, such as TPACK, proposed by Mishra and Koehler (2006) (See Figure 1). The integration of technological and pedagogical knowledge (TPACK) involves the assessment of the diverse knowledge that teachers need to effectively integrate technology into their teaching and ensure meaningful student learning. The knowledge required by this model includes technological, pedagogical, and content knowledge. The model emphasizes the importance of teachers being prepared to integrate technology in their teaching, considering not only the three components (CK, PK, and TK) separately, but also their intersection (Cabero, 2014; Samperio & Barragán, 2018).

• Technological-pedagogical knowledge, also known as (pedagogical content knowledge or PCK). It refers to knowledge about the use of technology in teaching and learning.

• Technological content knowledge, also known as (technological content knowledge or TCK). Refers to the understanding of how technology can influence the creation of discipline-specific content.

• Pedagogical Content Knowledge (PCK). Focuses on mastery of a specific subject and includes pedagogical actions that facilitate student acquisition of knowledge.

• TPACK, an acronym for technological, pedagogical, and disciplinary knowledge. It refers to the knowledge necessary for teachers to integrate technology into instruction and facilitate student learning (Mishra & Koehler, 2006).

Figure 1.

Technological Pedagogical Content Knowledge Framework
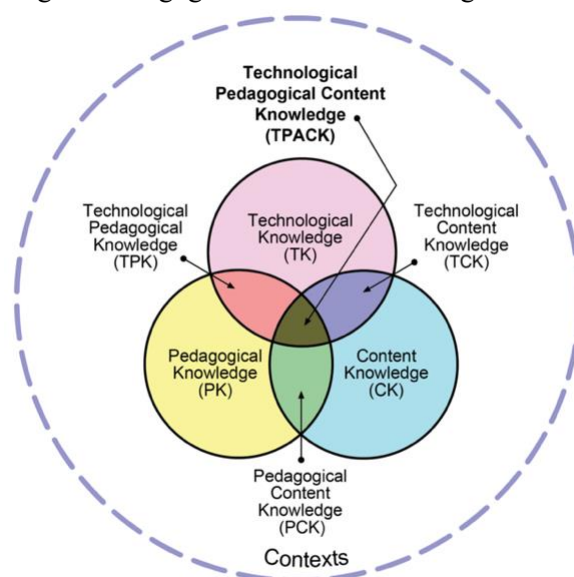
Source: TPACK.ORG (n.d.)

By bringing together these three areas of technological-pedagogical-disciplinary knowledge, teachers can use technology to enhance both their teaching and students' learning. In short, this model helps English teachers keep abreast of technological advances and enables them to use the latest tools and resources in their teaching in a more engaging and efficient manner. This is especially important in light of the recent shift to distance learning as an emergency measure during the COVID-19 pandemic (Farhadi & Öztürk, 2023).

METHOD

Research design

The research design is descriptive, as it "describes the characteristics of the population or phenomenon that is being studied. This methodology focuses more on the what of the research subject rather than the why of the research subject" (Manjunatha, 2019, p. 863). The study aims to gather measurable data for statistical analysis of a sample population (Manjunatha, 2019) to characterize

the adaptability to disruptive technologies of EFL pre-service teachers through the description of the areas of realization of their graduate profile.

Participants and research context

Research participants were selected using convenience sampling, a non-probability method that identifies participants based on their accessibility within the target population (Golzar et al., 2022). The study was conducted in the Practicum III course of an EFL teacher education program at a university in southern Chile. Four professors were responsible for seven EFL pre-service teachers each, resulting in seven participants since the researcher was one of the professors.

For the sampling, a total of 49 lesson plans from the seven EFL pre-service teachers who completed their practicum during Semester 1 of 2023 were considered. These pre-service teachers had completed 90% of the required compulsory and elective subjects to obtain a Bachelor's Degree in EFL Teaching.

The main purpose of Practicum III is to connect pedagogical work with the observation of methodologies applied in the classroom. This course emphasizes collaboration inside and outside the classroom within the context of EFL teaching and learning. Additionally, students interpret the impact of these pedagogical practices, contributing to the development of their teaching identity during their professional practicum.

Regarding the level of English proficiency of the participants, it should be noted that the *English Score* test of the British Council has been used to verify the achievement of the specific competence Nº8, which contributes to the graduation profile of the EFL teaching program studied: EFL pre-service teachers are expected to demonstrate an advanced level of proficiency in English (C1) at the oral and written levels, taking into account the social conventions and range of semiotic resources of each of the discourse communities and their contexts, in different socio-cultural contexts, both face-to-face and digital. In this regard, it was found that six of the seven participants were at level C1 according to the Common European Framework of Reference (CEFR) (Council of Europe, 2024). That is, 85.7% have C1 level, while 14.3% have B2 level.

The research was carried out in strict compliance with ethical standards, which include working with human subjects according to the Singapore Declaration, with informed consent signed by the participants.

Data collection instruments

In terms of data collection instruments, a four-point Likert scale with 40 items was adapted from Redecker (2017), *European Framework for the Digital Competence of Educators: DigCompEdu* (see Annex 1). The adaptation of the instrument was done in order to code the results obtained in the evaluations of the lesson plans and classroom implementations carried out by each participant, taking into account the most important aspects of Redecker's proposal: professional and pedagogical competences. Regarding the internal consistency of the instrument, it is given by Cronbach's Alpha with a reliability of 0.921, which is acceptable.

The four dimensions of the instrument considered: English as a foreign language proficiency (7 items), the teaching and learning process of English as a foreign language (12 items), the adequacy of the learning environment (7 items), and the integration of disruptive technologies into the teaching and learning process of English as a foreign language (14 items). These four dimensions cover the three areas of technological, pedagogical and disciplinary knowledge that an EFL teacher should have.

Each item was evaluated with a four-point parameter: (4) Outstanding, He/she performs in the trait above the expected manner; (3) Proficient, He/she performs in the trait according to the expected manner; (2) Basic, He/she performs initially in the trait; and (1) Unsatisfactory, the trait was not observed.

Data collection analysis

Data collection took place during the first semester of the academic year 2023 in the EFL Practicum III course at a Chilean university. For descriptive analysis, four dimensions presented in Table 1 are considered:

Table 1.

Dimensions of Data Collection Analysis

Dimension	Conceptual Definition	Operational Definition
English as a foreign language proficiency (*Content Knowledge*)	It allows transparency in comparing expected progress and outcomes of foreign language learning and it allows officials to set thresholds for both learners and teachers (Dewaele & Leung, 2022). In Chile, EFL teachers are expected to reach C1 level (Proficient user) according to the Common European Framework of Reference (CEFR) (Council of Europe, 2024).	Measures the adaptability of the EFL pre-service teacher to environments mediated by disruptive technologies based on the integration of technological, pedagogical, and content knowledge.
The teaching and learning process of English as a foreign language (*Content Knowledge*)	The contents that are taught are the result of a long path of transposition that is achieved during the didactic act. In this act, interrelationships are established between the personal components in which those who are in charge of the teaching, who plan and evaluate the process, have been imposed on those who are to learn (González, 2023).	Measures the adaptability
The adequacy of the learning environment (*Pedagogical Knowledge*)	A learning environment, in its narrower sense, is a conventional classroom and, in its widest sense, is the combination of a formal and informal education system where learning takes place both inside and outside the school for the purpose of achieving the set objectives (Adekoya et al., 2020).	

Integration of disruptive technologies into the teaching and learning process of English as a foreign language (*Technological Knowledge*)	The widespread adoption of digital technology offers a viable avenue for enhancing EFL teachers' performance. To embrace these pedagogical changes, EFL teachers should develop a comprehensive understanding of digital literacy and its application in language teaching. This includes not only technical skills but also an awareness of how digital tools can support different learning styles and objectives (Zou & Wang, 2024).

Source: Own elaboration.

The instrument evaluates how effectively an EFL pre-service teacher can thrive in an educational environment significantly influenced by disruptive technologies. It examines their ability to integrate knowledge of technology, instructional strategies, and English language teaching (see Figures 5, 6, 7, 8, and 9 in Annex 1).

FINDINGS

This section presents the results obtained in each of the performance dimensions analyzed during the 2023-1 academic period.

In the evaluation process, the work with seven EFL pre-service teachers in seven processes of lesson planning and lesson implementation is considered, using the adapted Likert scale. In the first three lessons, the results show the use of the dimensions: English as a foreign language proficiency; (71.4%) Outstanding, (28.6%) Proficient; the teaching and learning process of English as a foreign language, (85.7%) Outstanding, (14.3%) Proficient; the adequacy of the learning environment, (85.7%) Outstanding, (14.3%) Proficient as shown in Figure 2.

This finding is consistent with Martínez (2023), as 100% EFL pre-service teachers were not ready to teach English using [disruptive] technologies because they lacked knowledge, experience and control over online teaching platforms and applications. With respect to these results, it is worth emphasizing that, while technologies offer greater possibilities for teaching and learning, they also require teachers to undergo a major transformation in their pedagogical training (Zou & Wang, 2024).

These results required the development of performative actions within the practicum process: online seminars and practical workshops on digital teaching skills, technology-mediated language teaching and the use of disruptive technologies in EFL teaching. This is because the dimension integration of disruptive technologies into the teaching and learning process of English as a foreign language was unsatisfactorily observed (100%). The aim of utilizing technological devices was to digitize the teaching format. In this context, Martínez's (2023) findings are supported, highlighting

that teacher adaptability faces challenges associated with traditional teaching methods, including difficulties in communication and relationship-building with students. Consequently, adaptability and reflective practice have emerged as crucial strategic components of professional competence.

Figure 2.

Assessment of pre-service EFL teacher regarding adaptability to disruptive technology-mediated environments based on teacher professional profile
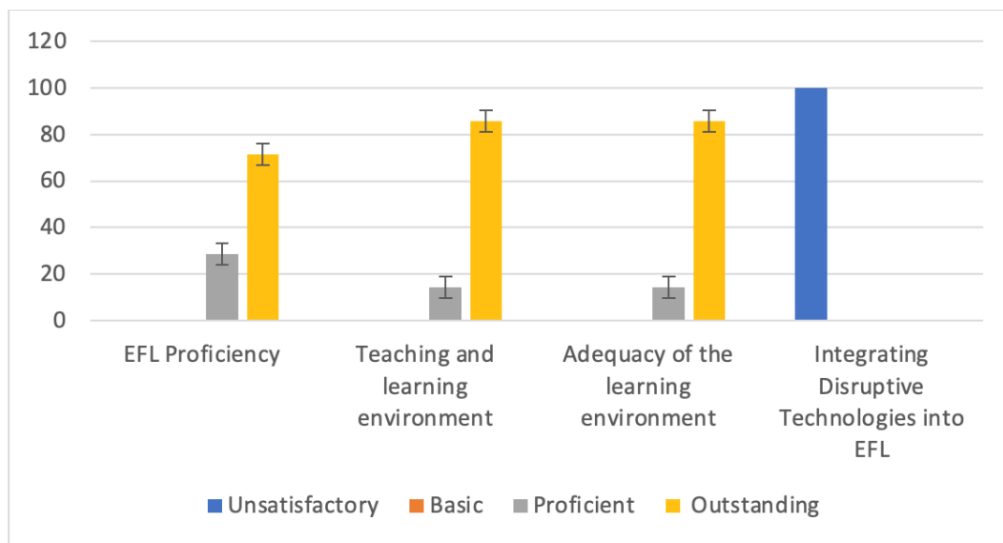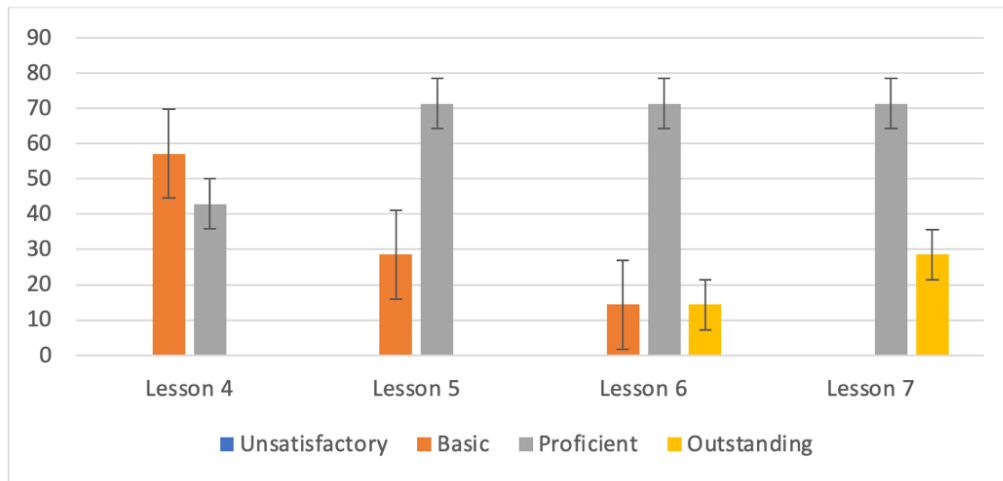

Source: Own elaboration.

For Dvir and Schatz-Oppenheimer (2020):

> Technological knowledge is needed in the 21st century. Technology skills should be integrated into teachers' training in colleges and universities. Teacher training programs should provide all the necessary training so that their graduates can go out and cope with the technological-pedagogical challenges. (p. 641)

After carrying out the described performative actions, the EFL pre-service teachers were evaluated in the four remaining processes. By averaging these four evaluation processes, it was observed that the dimensions of (1) English as a foreign language proficiency, (2) teaching and learning process of English as a foreign language, and (3) adequacy of the learning environment received ratings of (85.7%) Outstanding and (14.3%) Proficient. In other words, six of the participants showed outstanding performance, and only one of them was proficient. However, the dimension integration of disruptive technologies into the teaching and learning process of English as a foreign language was progressively integrated into the pedagogical practice as shown in Figure 3.

Figure 3.

Integration of disruptive technologies into the teaching and learning process of English as a foreign language

Source: Own elaboration.

This finding echoes (Flores-González, 2022) and show the gradual and progressive integration of the four key dimensions: English as a foreign language proficiency, the process of teaching and learning English as a foreign language, the adequacy of the learning environment, and the integration of disruptive technologies in the process of teaching and learning English as a foreign language, with the aim of adapting the teaching-learning process to innovative and disruptive teaching-learning environments. This allows these dimensions to be effectively aligned with the specific characteristics and requirements of the academic curriculum of EFL teacher education. The progressive inclusion and integration of these four fundamental dimensions aims to ensure that the development of digital teaching skills is carried out in a comprehensive and coherent manner with the established curricular objectives and, above all, with the training needs of EFL pre-service teachers.
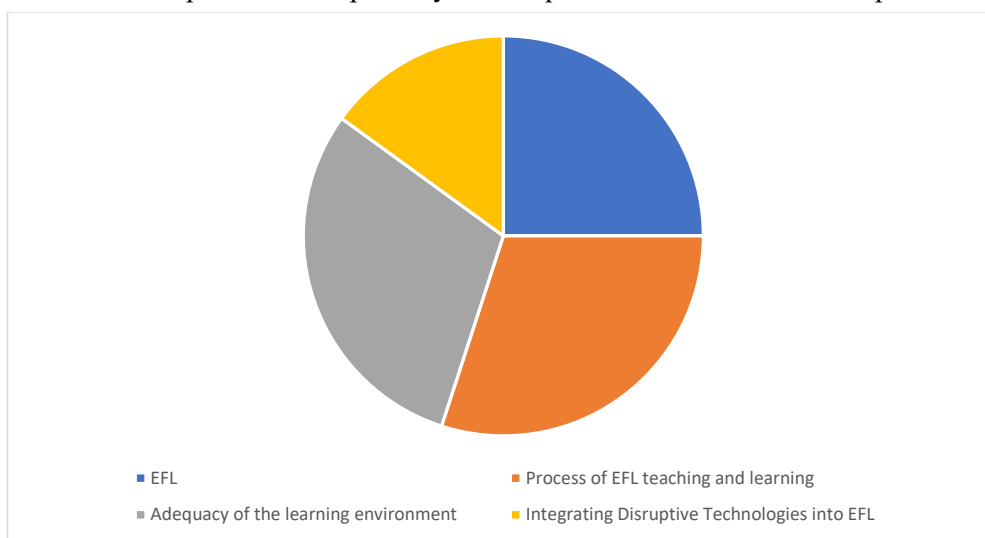
Finally, during the last four lessons planned and carried out by the seven EFL pre-service teachers, it was observed that the persistence in adapting and integrating the four dimensions was 100%, with minimal differences in terms of the performance developed during each evaluation. The integration of the four dimensions in the process of pedagogical practice was identified, as shown in Figure 4.

• English as a foreign language (25%): In this dimension, according to the scope of the graduate profile, EFL pre-service teachers communicate effectively in English, reaching level C1 of the Common European Framework of Reference for Languages. They are bilingual, biliterate and multicultural people who use English on a daily basis and can deal with all kinds of aspects of their functional lives, aware of the representational and constitutive power of languages. This *Content Knowledge* is characterized by:

- ☐ use of appropriate expressions and a wide range of vocabulary,

- ☐ use of different grammatical structures in a contextualized manner,

- ☐ use of English with confidence,

- ☐ clear and accurate pronunciation, rhythm and intonation,

- ☐ reading in English with varied volume and expression,

- ☐ writing with virtually no grammatical,

- ☐ writing with no spelling errors.

Figure 4.

Dimensions developed in the adaptability of EFL pre-service teachers to disruptive technologies

- EFL
- Process of EFL teaching and learning
- Adequacy of the learning environment
- Integrating Disruptive Technologies into EFL

Source: Own elaboration.

• The process of teaching and learning English as a foreign language (30%): In this dimension, according to the scope of the graduate profile, EFL pre-service teachers have a high level of linguistic awareness, based on a disciplinary knowledge of theoretical linguistics (phonetics, syntax and pragmatics) and applied linguistics, which allows them to understand and guide their own and their students' foreign language acquisition and learning processes. They study the phenomena of language, multilingualism, language acquisition and communication in their cognitive, individual, psycholinguistic and social dimensions. They see language as a dimension of being and different languages as different ways of being and meaning. This *Content Knowledge* is characterized by:

- ☐ clear statement of objectives, both general and specific have all their elements of language and communicative content,

- ☐relationship of language and communicative content to the objectives.

- ☐ use of inclusive teaching methods,

- ☐ consideration of learners' needs, interests, prior knowledge and levels of proficiency,

◻ clear communication of ideas and appropriate responses to learners' questions,

◻ coherent selection of teaching techniques or strategies which are related to the activity being developed,

◻ learning activities that meet the objectives of the class (opening, development and closure),

◻ parts of the lesson that are well connected,

◻ knowledge and mastery of the didactics of English as a foreign language that are present and well connected,

◻ consistency between knowledge and mastery of the didactics of English as a foreign language regarding the approach, method(s) and technique(s) that is or are used,

◻ the design of didactic materials that are appropriate to the needs and characteristics of the students,

◻ explanations that are easy for the students to understand,

◻ use of different and varied didactic resources.

• Adequacy of the learning environment (30%): In this dimension, according to the scope of the graduate profile, EFL pre-service teachers build learning together with their students, respecting their individuality through inclusive practices, choosing approaches and planning activities that adapt to the diversity of their classrooms. They are familiar with the theory and practice of pedagogical work and see it as a phenomenon in constant flux, which is why they are constantly updating and innovating. They are also aware of and critical of the current regulatory framework. They are compassionate, proactive and reflective, critically and constructively analyzing their own practice and that of other professionals. They promote collaborative and interdisciplinary work in the development of projects and assignments. This *Pedagogical Knowledge* is characterized by:

◻ deep knowledge of the students and adaptation of the class design to students' needs,

◻ establishment of conditions to promote students' learning of English,

◻ use and projection of the voice in an appropriate way, so that students listen without difficulty,

◻ interaction in a genuine, caring and respectful way,

◻ application of a sound classroom management plan regarding students' behavior,

◻ promotion of students' active participation,

◻ promotion of collaborative work and mutual accompaniment among students.

Integrating Disruptive Technologies into the Teaching and Learning of English as a foreign language (15%): Although this dimension is not included in the graduate profile (*Technological Knowledge*), EFL pre-service teachers are expected to:

◻ plan and implement digital devices and resources in the teaching process,

◻ develop of new formats and pedagogical methods for teaching,

◻ use technology in the classroom to support teaching,

 design lessons with different digital activities (teacher-centered and student-centered) to jointly reinforce the learning objective,

 design learning sessions, activities, and interactions in a digital environment,

 use technology to encourage and enhance collaboration among learners,

 use technology as part of collaborative tasks to enhance communication, collaboration, and collaborative knowledge creation,

 use technology to support self-regulated learning processes,

 use technology to develop formative and summative assessments,

 use technology to provide feedback on electronically submitted assignments,

 use technology to monitor student progress and provide remediation when needed,

 ensure that learning resources and activities are accessible to all students, including those with special needs,

 consider and respond to learners' (digital) expectations, skills, uses and misconceptions, as well as contextual, physical or cognitive limitations to the use of technology,

 consider the specific learning objective, context, pedagogical approach and learner group when adapting or creating digital learning resources.

CONCLUSIONS

With disruptive technologies, EFL teaching has the potential to break away from traditional practices, enabling the application of new pedagogical strategies. These strategies stimulate and enhance students' linguistic, communicative, cultural, and technological competencies in a more effective and up-to-date manner, aligning with the previously discussed social transformations and technological innovations.

To move away from traditional EFL teaching practices, teachers must adapt to the pedagogical use of disruptive technologies. In this context, adaptability as a formative process should be early, progressive, and contextualized within EFL teacher education to ensure the development of sustainable and adaptable competencies for a technology-mediated teaching and learning environment. This approach should also be transferable to students (Flores-González, 2022; Parra, 2022).

Considering the results obtained in the study, it is evident that EFL teacher education should promote the combined and integrated development of content, pedagogical and technological knowledge. The development of this integrated knowledge in teacher education is fundamental to the creation of authentic and contextualized learning contexts. In other words, an EFL teacher who possesses content, pedagogical and technological knowledge can effectively provide students with meaningful learning experiences that are applicable to real-life situations, thereby enhancing both his or her teaching and students' learning.

In the context of EFL teacher education in Chile, the results align with the findings of Barahona (2016), Martin and Rosas-Maldonado (2019), and Barahona and Darwin (2021). Their research indi-

cates that a teacher education model with a high theoretical focus, emphasizing advanced linguistic and communicative skills while maintaining a clear distinction between theoretical and practical training courses, often prioritizes content and pedagogical knowledge over technological knowledge. This characterization of the current landscape highlights key professional dimensions essential for enhancing teaching practices in EFL teacher education (Flores-González, 2022).

It can be concluded that the study objective has been achieved and the adaptability of EFL pre-service teachers to disruptive technologies is described through the characterization of the dimensions of their teaching profile: Content, pedagogical and technological knowledge. In this regard, the findings show that EFL pre-service teachers have areas of strength such as content knowledge (EFL proficiency with 25% and the teaching and learning process of EFL with 30%). They place a high priority on the actual methods, strategies and approaches available to teach EFL, considering it as an important pedagogical focus.

Pedagogical knowledge (the adequacy of the learning environment with 30%) suggests that they recognize the significance of factors like classroom setup, resources, and overall conduciveness for language acquisition. Technological knowledge (integration of disruptive technologies into the teaching and learning process of EFL with 15%) indicates that they see value in utilizing instructional technology, though it was a smaller emphasis compared to other dimensions.

This provides insight into the relative emphasis and priorities that EFL pre-service teachers place on different aspects of their teaching practice. Therefore, this formative rupture represents an area of opportunity.

Among the limitations, it can be mentioned that given the methodological nature of the study, which is focused on the quantitative analysis of collected data, qualitative analysis could also be included to deepen the dimensions addressed (Gogo & Musonda, 2022).

Finally, this study could be extended by developing pedagogical frameworks for integrating disruptive technologies in EFL teacher education, designing and evaluating technology-enhanced instructional methods, tracking the impact of disruptive technologies on teachers' ability to integrate technology, and conducting action research about the integration of disruptive technologies to understand challenges, strategies, and impacts on student learning outcomes.

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ANNEXES

Annex 1.

The design and adaptation of this instrument was verified by the coordination of pedagogical practices of the university under study.

Figure 5.

Evaluation of plans and execution of classes

Adaptabilidad de profesores en formación a tecnologías disruptivas en la enseñanza del inglés.

Docente en formación:_____
Centro de Práctica:_____
Grado:_____
Clase:_____
Fecha:_____
Evaluador:_____

Evaluación de los planes y ejecución de las clases

Parámetros
Destacado: Se desempeña en el rasgo de forma superior a la manera esperada.
Competente: Se desempeña en el rasgo de acuerdo a la manera esperada.
Básico: Se desempeña de forma inicial en el rasgo.
Insatisfactorio: No se observó el rasgo.

Variable: Competencia Lingüística y Comunicativa
Dimensión: Dominio del Idioma Inglés como Lengua Extranjera

Ítem		Destacado (3 pts.)	Competente (2 puntos)	Básico (1 pto)	Insatisfactorio (0 pt)
1	Usa expresiones apropiadas y una amplia gama de vocabulario.				
2	Utiliza estructuras diferentes estructuras gramaticales de forma contextualizada.				
3	Habla con confianza en el idioma inglés, alcanzando su punto máximo sin vacilación o interrupción del flujo de la conversación.				
4	La pronunciación, el ritmo y la entonación son siempre claros y precisos.				
5	Lee en inglés con volumen y expresión variados.				
6	Escribe virtualmente sin cometer errores gramaticales o de deletreo.				
7	Escribe virtualmente sin cometer errores de puntuación.				

Source: Own elaboration adapted from Redecker (2017, p. 1).

Figure 6.

Evaluation of plans and execution of classes

Variable: Competencia Didáctica-Pedagógica
Dimensión: Proceso de enseñanza y aprendizaje del Inglés como Lengua Extranjera

Ítem		Destacado (3 pts.)	Competente (2 puntos)	Básico (1 pto)	Insatisfactorio (0 pt)
8	Los objetivos tanto general como específicos fueron enunciados con claridad, y se evidencian sus elementos.				
9	Los contenidos lingüísticos y comunicativos guardan relación con los objetivos.				
10	Utiliza prácticas de enseñanza inclusivas.				
11	Toma en cuenta las necesidades, intereses, conocimientos previos y el nivel de dominio de la competencia lingüística y comunicativa del estudiantado.				
12	Expresa ideas claras, comunicándolas de manera efectiva y respondiendo apropiadamente a las preguntas del estudiantado.				
13	Las técnicas y/o estrategias de enseñanza son claras, coherentes y guardan relación con la actividad a desarrollar.				
14	Las actividades de aprendizaje responden a los objetivos de la clase (inicio, desarrollo y cierre).				
15	Las partes principales de la lección están presentes y bien conectadas.				
16	Demostró conocimiento y dominio de la didáctica del inglés como lengua extranjera, respecto a la concordancia entre el enfoque, método(s) y técnica(s) utilizadas.				

Source: Own elaboration adapted from Redecker (2017, p. 2).

Figure 7.

Evaluation of plans and execution of classes

17	El material didáctico entregado es apropiado a las necesidades y características del estudiantado.				
18	Las explicaciones son fáciles de entender por el estudiantado.				
19	Utiliza distintos y variados recursos instruccionales (digitales o análogos)				

Variable: Competencia Didáctica-Pedagógica
Dimensión: Adecuación del entorno de aprendizaje

Ítem		Destacado (3 pts.)	Competente (2 puntos)	Básico (1 pto)	Insatisfactorio (0 pt)
20	Tiene un profundo conocimiento de sus estudiantes y adapta el diseño de la clase a sus necesidades.				
21	La condición de clase creada promueve el aprendizaje del inglés en el estudiantado.				
22	Utiliza y proyecta su voz de manera apropiada, de modo que el estudiantado le escuchen sin dificultad.				
23	Interactúa y se relaciona de forma genuina, cuidadosa y respetuosa con el estudiantado				
24	Tiene y aplica un plan de manejo del aula sólido respecto a la conducta del estudiantado.				
25	Promueve la participación activa del estudiantado				
26	Promueve el trabajo colaborativo y acompañamiento mutuo en el estudiantado.				

Source: Own elaboration adapted from Redecker (2017, p. 3).

Figure 8.

Evaluation of plans and execution of classes

Variable: Competencia tecnológica
Dimensión: Integración de las tecnologías disruptivas al proceso de enseñanza-aprendizaje del Inglés como Lengua Extranjera

Ítem		Destacado (3 pts.)	Competente (2 puntos)	Básico (1 pto)	Insatisfactorio (0 pt)
27	Planifica e implementa dispositivos y recursos digitales en el proceso de enseñanza.				
28	Experimenta y desarrolla nuevos formatos y métodos pedagógicos para la instrucción.				
29	Utiliza tecnologías dispuestas en el aula para apoyar la instrucción, por ejemplo, pizarras electrónicas, dispositivos móviles.				
30	Estructura la lección de manera que las diferentes actividades digitales (dirigidas por el profesorado y dirigidas por el estudiantado) refuercen conjuntamente el objetivo de aprendizaje.				
31	Establece sesiones de aprendizaje, actividades e interacciones en un entorno digital.				
32	Utiliza las tecnologías para fomentar y mejorar la colaboración entre el estudiantado.				
33	Permite que el estudiantado utilice las tecnologías como parte de las tareas colaborativas, como un medio para mejorar la comunicación, la colaboración y la creación colaborativa de conocimientos.				
34	Utiliza las tecnologías para apoyar los procesos de aprendizaje autorregulados.				

Source: Own elaboration adapted from Redecker (2017, p. 4).

Figure 9.

Evaluation of plans and execution of classes

35	Utiliza las tecnologías para la evaluación formativa y sumativa.				
36	Utiliza la tecnología para dar retroalimentación sobre las tareas enviadas electrónicamente por sus estudiantes.				
37	Utiliza tecnologías para monitorear el progreso del estudiantado y brinda apoyo cuando sea necesario.				
38	Garantiza la accesibilidad a los recursos y actividades de aprendizaje, para el estudiantado, incluyendo quienes tienen necesidades especiales.				
39	Considera y responde a las expectativas, habilidades, usos y conceptos erróneos (digitales) del estudiantado, así como a las limitaciones contextuales, físicas o cognitivas para su uso de las tecnologías.				
40	Considera el objetivo específico de aprendizaje, el contexto, el enfoque pedagógico y el grupo de alumnos, al adaptar o crear recursos digitales de aprendizaje.				

Source: Own elaboration adapted from Redecker (2017, p. 5).