**UNIVERSITY OF EL SALVADOR**

**SCHOOL OF ARTS AND SCIENCES**

**DEPARTMENT OF FOREIGN LANGUAGES**

# *"APPLICATION OF THE TPACK MODEL FOR DESIGNING EFFECTIVE VIRTUAL COURSES"*

# *"APLICACIÓN DEL MODELO TPACK PARA EL DISEÑO DE CURSOS VIRTUALES EFICACES"*

**PRESENTED BY:**


BLANCA LUZ ESQUIVEL CLAVEL EC20004

DAMARIS ETELVINA SANCHEZ BLANCO SB18001


**IN ORDER TO OBTAIN THE DEGREE OF:**

BACHELOR'S DEGREE IN ENGLISH LANGUAGE TEACHING OPTION

**SPECIALIZATION PROFESSOR:**

MEVA. SEY DANISIA NAJARRO DE ALVARADO.

**GENERAL COORDINATOR OF THE GRADUATION PROCESS:**

LIC. MIGUEL ÁNGEL CARRANZA CAMPOS, MsE.

**SAN SALVADOR, EL SALVADOR, OCTOBER 2025.**

**AUTHORITIES OF THE UNIVERSITY OF EL SALVADOR**

**RECTOR**

ING. AGR. JUAN ROSA QUINTANILLA

**ACADEMIC VICE-RECTOR**

DRA. EVELYN BEATRIZ FARFÁN

**ADMINISTRATIVE VICE-RECTOR**

M.Sc. ROGER ARMANDO ARIAS ALVARADO

**GENERAL SECRETARY**

Lic. PEDRO ROSALÍO ESCOBAR CASTANEDA

**AUTHORITIES OF THE SCHOOL OF ARTS AND SCIENCES**

**DEAN**

MSc. JULIO CÉSAR GRANDE RIVIERA

**VICE-DEAN**

MSc. MARÍA BLAS CRUZ JURADO

**SECRETARY**

MAESTRA NATIVIDAD DE LAS MERCEDES THESHE PADILLA

**AUTHORITIES OF THE DEPARTMENT OF FOREIGN LANGUAGES**

**HEAD OF THE FOREIGN LANGUAGES DEPARTMENT**

MAESTRO JOSÉ ISRAEL OLIVA

**GENERAL COORDINATOR OF THE GRADUATION PROCESS**

LIC. MIGUEL ÁNGEL CARRANZA CAMPOS, MsE.

**SPECIALIZATION PROFESSOR**

MEVA. SEY DANISIA NAJARRO DE ALVARADO

# INDEX:

# ABSTRACT

The increasing demand for flexible and innovative educational modalities has established virtual learning environments as a key strategy in higher education. In foreign language teaching, the effectiveness of these environments depends not only on the use of digital platforms but also on the integration of pedagogical frameworks that ensure meaningful, interactive, and student-centered learning experiences. This study analyzes the application of the Technological Pedagogical Content Knowledge (TPACK) model as a theoretical and practical framework for designing virtual courses within the *Specialization Course in the Administration of Virtual Environments for Foreign Languages Teaching and Learning* at the University of El Salvador. The research explores the origins, evolution, and theoretical foundations of TPACK, highlighting its relevance in balancing content, pedagogy, and technology in online language education. It also examines case studies, challenges, and limitations, proposing strategies based on active learning, digital inclusion, and continuous teacher training. The findings indicate that applying TPACK contributes to the development of more integrated, effective, and student-centered teaching practices, strengthening teacher competencies for managing virtual environments and improving the quality, accessibility, and relevance of foreign language learning at the University of El Salvador. This study provides a reference framework for optimizing virtual language courses, fostering communicative skills, intercultural competence, and digital literacy.



***Keywords:*** *TPACK (Technological Pedagogical Content Knowledge), virtual learning environments, active learning, digital inclusion, teacher training, digital competencies, pedagogical and technological integration, educational quality.*

# RESUMEN

La creciente demanda de modalidades educativas flexibles e innovadoras ha consolidado a los entornos virtuales de aprendizaje como una estrategia clave en la educación superior. En la enseñanza de idiomas extranjeros, la efectividad de estos entornos depende no solo del uso de plataformas digitales, sino también de la integración de marcos pedagógicos que aseguren experiencias de aprendizaje significativas, interactivas y centradas en el estudiante. Este estudio analiza la aplicación del modelo de Conocimiento Tecnológico, Pedagógico y Disciplinar (TPACK) como marco teórico y práctico para el diseño de cursos virtuales en el *Curso de Especialización en Administración de Ambientes Virtuales para la Enseñanza y Aprendizaje de Idiomas Extranjeros* de la Universidad de El Salvador. La investigación explora el origen, la evolución y los fundamentos del modelo, destacando su relevancia para equilibrar contenido, pedagogía y tecnología en la enseñanza virtual de lenguas. Además, examina casos de implementación, desafíos y limitaciones, y propone estrategias basadas en aprendizaje activo, inclusión digital y formación docente continua. Los hallazgos indican que la aplicación del TPACK contribuye al desarrollo de prácticas docentes más integradas, efectivas y centradas en los estudiantes, fortaleciendo competencias para la gestión de entornos virtuales y mejorando la calidad, accesibilidad y pertinencia del aprendizaje de idiomas extranjeros en la Universidad de El Salvador. Este estudio ofrece un marco de referencia para la optimización de cursos virtuales de lenguas, fomentando habilidades comunicativas, competencia intercultural y alfabetización digital.

***Palabras claves:*** *TPACK (Technological Pedagogical Content Knowledge), entornos virtuales de aprendizaje, aprendizaje activo, inclusión digital, formación docente, competencias digitales, integración pedagógica y tecnológica, calidad educativa.*

# I. INTRODUCTION

In recent decades, technological advancements have profoundly transformed educational processes, creating new opportunities for teaching and learning in virtual environments. This transformation has had a particularly significant impact on foreign language education, where the use of digital resources, interactive platforms, and innovative methodologies has become essential to meet the demands of a globalized society. In this context, teachers face the challenge of not merely transferring content to a digital space, but designing meaningful, interactive, and student-centered learning experiences.

In response to this need, the Technological Pedagogical Content Knowledge (TPACK) framework has emerged as a key theoretical reference for guiding teaching practices in technology-mediated environments. The model posits that the quality of virtual instruction depends on the balanced integration of three components: mastery of disciplinary content (CK), pedagogical knowledge (PK), and the effective use of digital technologies (TK). The intersection of these three domains enables teachers to select and articulate technological tools with appropriate pedagogical strategies, ensuring more effective learning processes that are tailored to student needs.

The University of El Salvador, recognizing the current challenges in the professional development of foreign language teachers, has developed the *Specialization Program in the Administration of Virtual Learning Environments for the Teaching and Learning of Foreign Languages*. This program aims to strengthen the professional competencies necessary to manage virtual environments

efficiently, inclusively, and pedagogically. Within this framework, the application of the TPACK model is essential to ensure that language courses are not only technologically supported but also foster communicative skills, intercultural competence, and digital literacy.

This study aims to analyze and substantiate the relevance of the TPACK model in the design of virtual courses for foreign language teaching within the specialization program. Moreover, a detailed description of the activities carried out throughout the specialization course is presented. The specialization course consisted of three modules, each developed over eight weeks. This study presents the knowledge gained in class, the assessed activities completed, the tools used to implement them in a virtual classroom environment, and how undergraduates can enhance their skills to create innovative classes in a virtual setting utilizing technology.

Additionally, it seeks to identify the benefits, challenges, and potential implications of its implementation, with the goal of contributing to the enhancement of educational quality and the comprehensive training of teachers capable of addressing the demands of higher education in virtual contexts.

# II. OBJECTIVES:

## GENERAL OBJECTIVE:

To analyze and justify the use of the TPACK model in designing virtual courses for foreign language teaching and learning, with the purpose of enhancing educational quality and promoting the effective integration of pedagogical, technological, and content knowledge in the Specialization Course in the Administration of Virtual Environments for Foreign Language Teaching and Learning at the University of El Salvador.

## SPECIFIC OBJECTIVES:

- To identify the theoretical and pedagogical foundations of the TPACK model and its relevance for foreign language teaching in virtual environments.
- To examine technological integration strategies and active learning methodologies that enhance the effectiveness of virtual courses within the specialization program.
- To evaluate the challenges, limitations, and best practices in implementing the TPACK model and propose recommendations to optimize the design and management of virtual learning environments for foreign language education.

# III. THEORETICAL FRAMEWORK

## 1. Application of the TPACK Model for Designing Effective Virtual Courses.

### 1.1 Integrating Knowledge for Virtual Course Design

The rapid technological development of recent decades has substantially transformed educational processes, creating new opportunities but also significant challenges for teaching practices. In today's context, virtual courses must not only transfer content to a digital platform, but also be designed as comprehensive, interactive, and meaningful learning experiences. The quality of such courses depends on the ability of teachers to integrate disciplinary, pedagogical, and technological knowledge in a balanced manner.

In this regard, **Technological Pedagogical Content Knowledge (TPACK)** constitutes a theoretical model that explains how the relationship among these three domains of knowledge should be articulated to foster effective teaching in technology-mediated environments (Mishra & Koehler, 2006). This model has become a fundamental reference in educational research and teacher training to respond to the demands of online and virtual education.

### 1.2. Origin and Evolution of the TPACK Model.

The foundational concept of TPACK **originates from** Pedagogical Content Knowledge (PCK) proposed by Shulman (1986), who argued that effective teaching cannot be understood solely as mastery of disciplinary content but also requires the ability to transform such content into forms that are understandable and accessible to students. Shulman emphasized that pedagogical knowledge and

content knowledge are intrinsically connected, and that the teacher's role is to build bridges between them.

Later, with advances in educational technology, Mishra and Koehler (2006) recognized the need to incorporate a third element: **technological knowledge (TK)**. Thus, the TPACK model emerged, proposing that designing effective teaching and learning experiences in the digital era requires not only knowing what to teach (content) and how to teach it (pedagogy), but also with which technological tools to do so.

The main contribution of the model lies in describing the dynamic intersection of the three types of knowledge:

- **Content Knowledge (CK):** mastery of concepts, theories, procedures, and epistemological structures of the discipline.
- **Pedagogical Knowledge (PK):** understanding of methods, strategies, learning theories, and management of the teaching process.
- **Technological Knowledge (TK):** knowledge of digital tools, their functions, limitations, and potential uses in learning.

From this interrelation emerge three subcategories:

- **PCK (Pedagogical Content Knowledge):** specific strategies for teaching particular content.
- **TCK (Technological Content Knowledge):** ways in which technology transforms the representation of disciplinary knowledge.

- **TPK (Technological Pedagogical Knowledge):** how technology modifies or enhances pedagogical strategies.

The convergence of all three domains forms **TPACK**, considered the core of effective teaching in the digital age (Koehler & Mishra, 2009).

### 1.3. Theoretical and Pedagogical Foundations.

The TPACK model is grounded in several pedagogical approaches and learning theories that legitimize it as a conceptual framework:

1. **Constructivism** emphasizes that knowledge is actively built through student interaction with the environment and others. In virtual settings, technological tools offer collaborative, simulation, and experimentation spaces that enhance this approach (Vygotsky, 1978).
2. **Connectivism**, proposed by Siemens (2005), argues that in the digital age learning occurs through networks and connections with information sources. Under this perspective, TPACK facilitates the integration of technologies that enable students to engage with communities of practice, open resources, and networked learning environments.
3. **Cognitive Load Theory**, developed by Sweller (1988), warns that learning can be hindered if instructional material overloads working memory. TPACK contributes to designing clear, segmented, and coherent digital materials aligned with Mayer's (2009) multimedia learning principles.
4. **Socio-technical Approach** highlights that technology is not neutral but responds to social, cultural, and institutional conditions. This implies that

implementing TPACK in virtual education must also address issues such as accessibility, equity, and data ethics (Voogt et al., 2013).

### 1.4. Application of TPACK in the Design of Virtual Courses.

The practical application of TPACK in virtual course design can be structured in six phases:

1. **Context Analysis**

   Assessment of student characteristics (academic level, digital skills, device access), institutional resources, and connectivity conditions. This diagnosis is crucial to determine which technologies are viable and appropriate.

2. **Definition of Learning Outcomes**

   Objectives should be specific, measurable, and aligned with both the discipline and 21st-century digital competencies (critical thinking, collaboration, digital literacy).

3. **Pedagogical Selection**

   Active methodologies are chosen to promote student-centered learning: project-based learning, flipped classroom, collaborative learning, gamification, among others.

4. **Technological Selection**

   The choice of digital tools must respond to criteria of pedagogical relevance, accessibility, cost, and usability. For example, an interactive simulator may be more appropriate than a static text for teaching abstract scientific concepts.

5. **Integrated Design**

   The above elements are articulated into concrete activities to achieve the objectives. This is where true TPACK integration occurs: the teacher selects technologies that enhance pedagogical strategies to teach specific content.

6. **Evaluation and Feedback**

   Assessment must be continuous and formative, employing both traditional instruments (rubrics, quizzes) and digital resources (learning analytics, discussion forums, self-assessments).

## 1.5. Practical Application Examples.

### Example 1: Foreign Language Course (Intermediate Level)

- **CK:** development of oral communication skills.
- **PK:** communicative task-based method.
- **TK:** videoconferencing platforms, audio recording apps, virtual forums.
- **TPACK Integration:** synchronous sessions with breakout rooms for pair work; recording dialogues as tasks; formative feedback through digital rubrics.

### Example 2: Natural Sciences Course (University Level)

- **CK:** kinematics and analysis of motion graphs.
- **PK:** inquiry- and experimentation-based learning.
- **TK:** interactive simulators, collaborative spreadsheets, virtual lab environments.

- **TPACK Integration:** simulations to manipulate variables; data analysis in shared spreadsheets; discussion forums to interpret results and formulate hypotheses.

### 1.6. Challenges and Limitations.

Despite its potential, implementing TPACK in virtual courses presents certain limitations:

- **Digital divide:** inequality in access to devices and connectivity reduces the effectiveness of virtual learning.
- **Insufficient teacher training:** many teachers master content but lack the pedagogical or technological strategies needed for effective integration.
- **Rapid technological obsolescence:** constant innovation demands frequent updates, requiring time and resources.
- **Complex evaluation:** measuring the impact of TPACK on learning requires systematic, methodologically sound research (Voogt et al., 2013).
- **Ethical and privacy concerns:** digital platforms involve handling personal data that must be protected under principles of security and ethics.

### 1.7. Partial Conclusions.

The TPACK model constitutes a robust theoretical framework that guides teachers in designing effective virtual courses by promoting the balanced integration of content, pedagogy, and technology. Its importance lies in encouraging reflective, contextualized, and student-centered teaching. However, successful implementation requires institutional support, continuous professional

development, and policies that foster accessibility and inclusion in virtual environments.

## 1.8. State of the Art on the Application of the TPACK Model in Virtual Education.

Research on the TPACK model has grown significantly over the past two decades, consolidating it as one of the most widely used frameworks for studying the integration of technology into teaching. Below are the main trends and findings of recent studies regarding its application in the design of virtual courses:

### 1.8.1. TPACK in Teacher Training.

Several studies have explored the incorporation of the TPACK model into preservice and in-service teacher training programs. For instance, Chai, Koh, and Tsai (2013) found that training courses combining practical experiences with critical reflection foster a more balanced development of the three TPACK domains. Similarly, Koehler et al. (2014) pointed out that collaborative design projects among teachers enhance their understanding of the model and promote its real application in educational contexts.

In Latin America, studies such as Cabero and Barroso (2016) highlight that many training programs still prioritize mastery of digital tools over pedagogical integration, leading to a partial development of TPACK.

### 1.8.2. Application of TPACK in University Virtual Courses.

Various studies have documented the relevance of the model for designing virtual courses in higher education. Muñoz-Carril, González-Sanmamed, and Hernández-Sellés (2013) found that TPACK provides an effective framework for selecting digital tools aligned with learning objectives, improving the perceived quality of online courses.

More recently, studies conducted in European universities (Lopez-Pérez et al., 2019) have shown that applying TPACK contributes to increased student engagement and satisfaction in virtual environments, particularly when active methodologies mediated by technology are used (such as flipped classrooms and project-based learning).

### 1.8.3. Evidence in Primary and Secondary Education.

The application of TPACK is not limited to higher education. Harris and Hofer (2011) developed taxonomies of learning activities based on TPACK that have been applied in primary and secondary education, showing improvements in lesson planning and meaningful ICT integration in curricula.

In developing countries, research such as that of Rienties et al. (2016) has demonstrated that the use of TPACK in virtual environments can reduce learning gaps if accompanied by policies ensuring access to technological infrastructure.

### 1.8.4. Limitations and Research Gaps.

Despite its contributions, the literature also identifies limitations. First, Voogt et al. (2013) note that there is still no consensus on standardized instruments to measure teachers' levels of TPACK. Moreover, much research has focused on higher education, leaving its application in primary education and vocational training underexplored.

Another relevant gap is the lack of longitudinal studies that assess the sustained impact of TPACK on long-term learning outcomes (Schmidt et al., 2009). Finally, there is an emerging but still limited interest in analyzing the relationship between TPACK and issues of ethics, inclusion, and accessibility in virtual environments (Cabero-Almenara et al., 2020).

## 1.9. Conclusions from the State of the Art.

The literature review shows that TPACK has become a key theoretical framework in the field of virtual education and teacher training. Studies consistently emphasize its usefulness in designing more coherent and effective online courses, especially when accompanied by practical training and pedagogical reflection. However, challenges remain regarding the measurement of the model, its implementation in non-university levels, and the need to deepen its relationship with digital inclusion and educational equity.

Therefore, future research should aim at developing more precise instruments to assess TPACK, as well as studying its impact in culturally and socially diverse contexts. This will contribute to consolidating TPACK not only as a conceptual

framework but also as an operational tool for enhancing educational quality in virtual environments

## IV. DESCRIPTION OF ACTIVITIES

### Module I

The first module, called “Online Foreign Languages Teaching” of the Specialization Course in the Administration of Virtual Environments for Foreign Languages Teaching and Learning, presented various learning theories for teaching English that can be applied in an online way using different technological tools to make it easy and understandable for the effective teaching and learning process through a virtual environment.

The module was developed during eight weeks; the topics, tools, and activities carried out were the following:

**Week one:**

During the first week, the instructor explained to the undergraduates all the activities to be developed in the course. The first week was focused on reviewing and learning about different theories of learning that can help teachers develop their classes properly, effectively, and functionally for students in a virtual setting. Some of the theories learned were: Behaviorism, Cognitivism, Constructivism, Humanism, and Connectivism. All the participants discussed the different theories and shared different opinions on how the theories influence the teaching and

learning process through virtual classes and how they make the process favorable for virtual education.

**Week two:**

In week two, undergraduates discussed Synchronous and Asynchronous Learning in an online course. The instructor explained the differences between the previous types of learning mentioned in an online course, clarifying doubts and making participants share different opinions about how to apply them in an online course in the best way possible. During this week, undergraduates developed the First Evaluated Activity called “Live Discussion Forum”. The activity consisted of discussing some questions asked by the instructor and participants about the different theories of learning, and also about the different approaches to be used to teach students in an online course. The activity was developed orally, and everyone shared their different points of view about what others said.

**Week three:**

In week three, undergraduates were focused on learning about the different Learning Management Systems. The instructor explained to participants the definition of LMS, showed the most common and effective ones, mentioned the uses, and explained how a good organization of the contents and materials for students can improve the teaching and learning process through online education.

**Week four:**

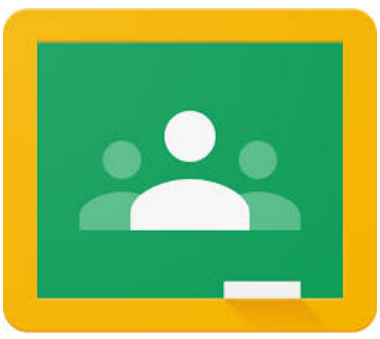
During week four, participants continued focusing on LMS, but this time they developed the Second Evaluated Activity called “Infographics”. Undergraduates

had to create infographics that showed important information and details about some Learning Management Systems in a creative way through the use of the virtual platform called Canva.


*Images shown in this document were taken legally from Google, notice references to see the credits of the official owners.*

**Week five:**

In week five, undergraduates learned deeply about Google Classroom and the different options that it offers to teachers for organizing content, materials, activities, and more for students when they have access to the virtual classroom. Google Classroom offers many options to create a personalized virtual classroom, providing the opportunity to distribute the online course into different sections depending on the different activities established by the teacher, which is helpful to organize the course in an easy-to-use way.



*Images shown in this document were taken legally from Google,*

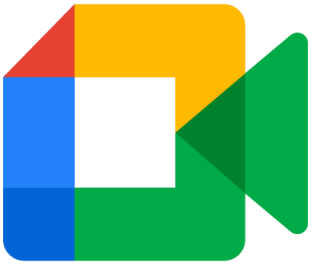
*notice references to see the credits of the official owners.*

**Week six:**

During week six, the instructor provided participants with the best tips to organize the virtual classroom to make it understandable and neat for students to check the different materials and content learned in class through the use of Google Classroom. In this opportunity, undergraduates developed the Third Evaluated Activity called “A Virtual Class in Google Classroom”. The activity consisted of creating, designing, and organizing a virtual class in Google Classroom. Creating a course related to an English subject, adding resources for the class, publishing activities, and more.

**Week seven:**

In week seven, undergraduates learned about videoconferencing platforms. The instructor course showed participants some videoconferencing platforms very useful for developing synchronous classes, such as Microsoft Teams, Google Meet, and more. Participants explored the uses, different options, and they also practiced using Microsoft Teams to check the teacher’s perspective on the use of the platform.



*Images shown in this document were taken legally from Google,*

*notice references to see the credits of the official owners.*

**Week eight:**

To conclude module I, during week eight, undergraduates put into practice their knowledge to develop the Fourth Evaluated Activity called “Online Class Through Google Meet”. Participants developed the class using the videoconferencing platform Google Meet to do it in a synchronous way; they also used the LMS platform Google Classroom to carry out their activities and upload materials to the students, making use of the different tools it provides to develop an effective virtual class.

**Module II**

The second module of the specialization course was called “Educational Applications for Learning a Foreign Language”. The module was focused on getting undergraduates familiar with theoretical information about diverse technological tools for teaching and learning a language by exploring their

functions available to develop classes or educational resources more easily and dynamically.

The second module was also developed during 8 weeks; the contents, activities, and tools used were the following:

**Week one:**

During the first week of the module, the instructor explained to the undergraduates all the activities to be carried out throughout the second module. This week, the instructor explained educational technology, and students also learned about the TPACK model.

**Week two:**

In the second week, students learned about the technological tool called Liveworksheets. This tool is very useful for teachers to create online tests; Liveworksheets provides different options to create tests with different kinds of items to be developed by students in an online way. During this week, undergraduates carried out the First Evaluated Activity of the second module, which consisted of creating a video tutorial through the use of Google Meet to demonstrate how to create interactive worksheets in Liveworksheets as an educator.

Besides, undergraduates learned about another interesting technological tool called Classroomscreen, which is a tool that helps teachers organize materials to develop an online class through the different resources that allow teachers to develop dynamic activities during an online class.


*Images shown in this document were taken legally from Google,*

*notice references to see the credits of the official owners.*

**Week three:**

During the third week of the module, students were focused on Artificial Intelligence (AI). Undergraduates learned what AI is, how AI impacts teaching and learning, Ethics in the use of AI, APA guidelines on how to cite ChatGPT, and relevant information about the use of AI in education.

**Week four:**

During week four, undergraduates learned about different technological tools that make use of AI to create different educational materials to use in a class. Students learned about Gamma, a very useful tool that teachers can use to create a PPT in a few minutes. Another tool learned during this week was ImageFX, which uses AI to generate images following the design you establish. Besides, students learned about Powtoon, which is a technological tool that allows people to create videos by using a PPT to show their content.

This week, students developed the Second Evaluated Activity of the second module. Undergraduates had to create a video in Powtoon, showing the selected topic and explaining AI-powered technology tools for educators.


*Images shown in this document were taken legally from Google, notice references to see the credits of the official owners.*

**Week five:**

Undergraduates continued learning about different technological tools useful for teaching in an online way. During week five, students learned about Miro, which is a collaborative online whiteboard tool. Another tool learned was Nearpod, which is a platform used to create interactive lessons for students. Besides, the instructor showed another tool called Word Art; this tool is useful to create words creatively.



*Images shown in this document were taken legally from Google,*

*notice references to see the credits of the official owners.*

**Week six:**

During week six, students learned how to use Narakeet. This technological tool is used to create videos narrated by an AI voice. This week, undergraduates developed the Fourth Evaluated Activity. For the activity, they designed a class and developed it through Google Meet, but this time, students used 3 of the technological tools learned throughout the module.

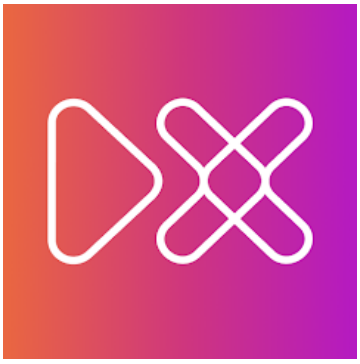
Additionally, this week the instructor showed students how to use the tool CoolText, which is a tool designed to generate creative and attractive logos. Another tool learned was NotebookLM, which is a tool that allows people to provide a specific summary of the content they insert.


*Images shown in this document were taken legally from Google,*

*notice references to see the credits of the official owners.*

**Week seven:**

This week, the Instructor presented an interesting technological tool called Delightex. This is an easy-to-use platform to design 3D spaces for teaching in a creative way. Teachers can design 3D scenarios to develop interactive, creative, and dynamic activities for students. Undergraduates were practicing in groups the different options it offers.



*Images shown in this document were taken legally from Google,*

*notice references to see the credits of the official owners.*

**Week eight:**

To conclude module II, undergraduates developed the Fourth Evaluated Activity during the last week. Students developed a Storytelling Project on Delightex. They created a story, developing a specific topic, and designing activities into 3D scenarios. Students worked in groups and presented their storytelling projects as the last activity of module II.

## Module III

The last module, called “Design of Didactic Materials for Virtual Environments”, presented a variety of web tools used to design digital educational materials, such as podcasts, online presentations, interactive images, videos, and more. The importance of learning how to design virtual didactic materials is to have resources that complement and enhance the quality of the virtual education for an effective teaching-learning process of foreign languages.

The third and last module of the specialization course had a duration of 8 weeks. The distribution of contents, activities, and evaluations was the following:

**Week one:**

During the first week of the last module, the instructor explained to the undergraduates all the contents, activities, and projects to be studied and evaluated. Besides, students learned about different multimedia resources, fundamentals of using multimedia resources in a virtual environment, and the creation of a podcast.

**Week two:**

For week two, undergraduates learned about two technological tools used to elaborate and publish a podcast on the web. The first tool is called Adobe Podcast, which is an AI-powered audio tool designed to create, edit, and polish a podcast to make your creation more professional and attractive to your audience. Furthermore, students learned about how to use SoundCloud, which is an online

platform that allows people to publish their podcasts and share their content with more people through the web.

In addition, undergraduates developed the First Evaluated Activity of the last module. Students recorded, edited, and published on the web their own podcast talking about educational content attractive for a specific audience in order to use the tool for creating didactic material used in a virtual environment.


*Images shown in this document were taken legally from Google, notice references to see the credits of the official owners.*

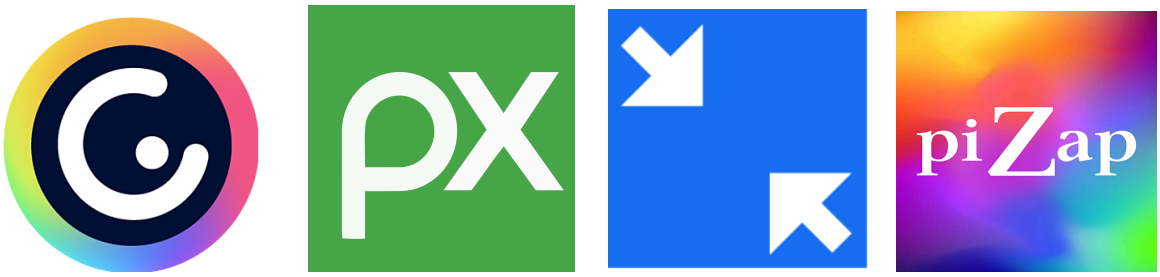
**Week three:**

Another attractive and interesting tool learned in week three was Genially. Students continued learning about the creation of didactic materials used for a virtual environment, and undergraduates focused their attention on Genially, which is one of the best tools for creating interactive images. They learned and practiced the different options it offers to design innovative digital materials to share with students in a virtual class.

Besides, during this week students elaborated their Second Evaluated Activity. For the activity, students designed, created, and shared an interactive image created in

Genially. The interactive image was related to a specific educational content. In this activity students had the opportunity to explore all the options and tools that Genially provides to create attractive, interesting, and interactive virtual didactic resources.

Additionally, during the week, students learned about three interesting tools: Pixabay, which is a tool used to explore and find different images with excellent quality to be downloaded totally free. Then, another tool explored was ReduceImages, a tool used to modify the size of any image to adapt your material in the best way possible for the purposes you use it. And the last tool was PiZap, which is a tool used to edit and creatively modify photos.




*Images shown in this document were taken legally from Google,*

*notice references to see the credits of the official owners.*

**Week four:**

In the fourth week of the last module, undergraduates learned about fundamental aspects related to typography when designing content and writing for students. This time, students prepared a Written Report where they specified what they learned in the specialization course, providing details about the contents, activities, and technological tools learned to utilize them as a teacher in a virtual course.

**Week five:**

During week five, undergraduates learned about how to create a website using Google Sites. Students were focusing their attention on the uses, tools, and resources it offers to design and create an attractive and creative website. Google Sites is an interesting tool that can help teachers publish information and concrete material for students to make the classes attractive in a virtual environment.

*Images shown in this document were taken legally from Google, notice references to see the credits of the official owners.*

**Week six:**

In week six, participants learned about the fundamentals of creating presentations in a virtual environment. Undergraduates were working on the elaboration of digital presentations using Google Presentations. Besides, students elaborated an evaluated activity that consisted of the creation of a Google Presentation in order to put into practice the knowledge obtained to design and elaborate virtual didactic materials for students.

*Images shown in this document were taken legally from Google,*

*notice references to see the credits of the official owners.*

**Week seven:**

Throughout week seven, undergraduates learned about the fundamentals of video creation to be applied to students in a virtual course. Besides, students elaborated an evaluated activity. For the activity, they elaborated an educational video.

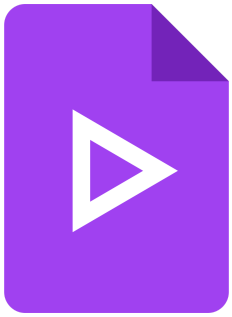
In addition, participants started to work on the integrative assignment to be evaluated in the last week of the course.

**Week eight:**

To conclude module III, in the final week of the specialization course, undergraduates were focused on the Google Vids working environment. This time, undergraduates were working on the Final Written Report about the specialization course, where they specified all the knowledge they learned throughout the course.

Finally, as the last evaluated activity, undergraduates developed a live defense of the Integrative task they were working on previously to put into practice all the skills

acquired during the Specialization Course in the Administration of Virtual Environments for Foreign Languages Teaching and Learning.



*Images shown in this document were taken legally from Google, notice references to see the credits of the official owners.*

## V. ACHIEVEMENTS

The Specialization Course in the Administration of Virtual Environments for Foreign Languages Teaching and Learning provided undergraduates with various learning experiences throughout the three modules developed, which allowed them to achieve different goals and develop new skills for teaching students in a virtual environment.

In the first module, undergraduates learned the fundamentals of online education and applied different learning theories for teaching English in a virtual environment through the use of technological tools. Besides, they learned about the Learning Management System (LMS) to set up an adequate and effective virtual classroom for students in the virtual modality.

During the second module, undergraduates learned about different educational applications for teaching and learning a foreign language in a virtual modality. Students got familiar with theoretical information about a variety of technological tools and their functions, to apply them in a virtual educational environment.

Throughout the last module of the specialization course, undergraduates learned how to design didactic materials for virtual environments through the use of technological tools. Students designed creative, attractive, and effective digital materials to be used in the teaching and learning of foreign languages.

Undergraduates learned different learning theories, technological tools for teaching virtually, a variety of platforms to create didactic resources, and fundamentals to develop an effective teaching-learning process in the virtual modality.

# VI. CONCLUSIONS

1. Importance of the Specialization Course: The *Specialization Course in the Administration of Virtual Environments for Foreign Languages Teaching and Learning* is a key strategy for strengthening teachers' competencies in managing virtual environments, ensuring that educators are prepared to design and manage effective, inclusive, and student-centered learning experiences.

2. Integration of TPACK in Language Teaching: Applying the TPACK model within the course allows teachers to understand and balance content, pedagogical, and technological knowledge, facilitating the selection of digital tools and active methodologies that enhance foreign language teaching in virtual environments.

3. Strengthening Teaching Practice and Pedagogical Innovation: The course encourages the adoption of innovative methodologies such as active learning, flipped classroom, and gamification, promoting student motivation and meaningful learning in language courses.

4. Development of Digital Competencies and Inclusion: Participants acquire essential digital skills to manage virtual environments, fostering educational inclusion, reducing the technological gap among students, and promoting digital literacy and intercultural competence.

5. Future Projection and Sustainability: The course lays the foundation for the continuous improvement of virtual education at the University of El Salvador, providing both a conceptual and practical framework that can be applied to other

programs and educational contexts, consolidating high-quality and innovative foreign language teaching in virtual environments.

## VII. RECOMMENDATIONS

The following recommendations are addressed to the Department of Foreign Languages of the University of El Salvador and its academic members, taking into consideration the facts discussed:

1. Strengthen continuous teacher training: It is recommended to implement periodic training programs on the use of the TPACK model and the management of digital tools, ensuring that the Department of Languages' teachers acquire the competencies needed to design and manage effective virtual courses.

2. Promote pedagogical and technological integration: The authorities of the School of Humanities should foster policies that encourage the planning and execution of virtual courses that balance content, pedagogy, and technology, ensuring meaningful and student-centered learning experiences.

3. Optimize technological resources and digital access: Ensure the availability of platforms, software, and devices necessary for virtual teaching, as well as equitable access policies to reduce the digital divide among students.

4. Encourage active methodologies and collaborative learning: Promote innovative pedagogical approaches, such as flipped classrooms, gamification, and project-based learning, to enhance student participation, motivation, and autonomy.

5. Continuous evaluation and feedback: The Department of Languages should implement mechanisms for continuous assessment and analysis of virtual course effectiveness, using both traditional metrics and learning analytics to continuously improve educational quality.

## VIII. BIBLIOGRAPHY


- Adobe Podcast Website. (n.d.). Adobe Podcast logo. https://podcast.adobe.com/en
- Cabero, J., & Barroso, J. (2016). The educational possibilities of augmented reality. *NAER: New Approaches in Educational Research, 5*(1), 44–50. https://doi.org/10.7821/naer.2016.1.140
- Cabero-Almenara, J., Romero-Tena, R., & Palacios-Rodríguez, A. (2020). Teachers' digital competence: A review of the literature on the TPACK model. *Australasian Journal of Educational Technology, 36*(6), 123–135. https://doi.org/10.14742/ajet.5812
- Canva Website. (n.d). Canva logo. https://www.canva.com/
- Chai, C. S., Koh, J. H. L., & Tsai, C. C. (2013). A review of technological pedagogical content knowledge. *Educational Technology & Society, 16*(2), 31–51.
- Classroomscreen Website. (n.d.). Classroomscreen logo. https://classroomscreen.com/
- CoolText Website. (n.d.). CoolText logo. https://cooltext.com/
- Delightex Website. (n.d). Delightex logo. https://edu.delightex.com/
- Gamma Website. (n.d). Gamma logo. https://gamma.app/?utm_source=google&utm_medium=search&utm_campaign=22882492255&utm_content=181460289337&utm_term=gamma&utm_id=tw&g

ad_source=1&gad_campaignid=22882492255&gbraid=0AAAAAqWjqPRRlDT0h1g7QrZ9Qx-00qfdJ&gclid=CjwKCAjwiY_GBhBEEiwAFaghvjBI0spUxv3Pb7HAR7rS7EOYKVjti9P61QbLooup2y9UW8ADHteRyxoCFe4QAvD_BwE

- Genially Website. (n.d.). Genially logo. https://app.genially.com/teams/68b617959d5c1d7912ad2227/home
- Google Classroom Website. (n.d). Google Classroom logo. https://classroom.google.com/h
- Google Meet Website. (n.d.). Google Meet logo. https://meet.google.com/landing?hs=197&authuser=0
- Google Sites Website. (n.d.). Google Sites logo. https://sites.google.com/?tgif=d
- Google Slides Website. (n.d.). Google Slides logo. https://docs.google.com/presentation/d/1WqUh6xUyn6DFjDgoVGGeoCckcImG0C0DrY7n4iw6sd8/edit?slide=id.p#slide=id.p
- Google Vids Website. (n.d.). Google Vids logo. https://workspace-google-com.translate.goog/products/vids/?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=es&_x_tr_pto=tc
- Harris, J., & Hofer, M. (2011). Technological pedagogical content knowledge (TPACK) in action: A descriptive study of secondary teachers' curriculum-based, technology-related instructional planning. *Journal of Research on Technology in Education, 43*(3), 211–229. https://doi.org/10.1080/15391523.2011.10782570
- ImageFX Website. (n.d.). ImageFX logo. https://labs.google/fx/es/tools/image-fx

- Koehler, M. J., Mishra, P., Kereluik, K., Shin, T. S., & Graham, C. R. (2014). The technological pedagogical content knowledge framework. In J. M. Spector, M. D. Merrill, J. Elen, & M. J. Bishop (Eds.), *Handbook of research on educational communications and technology* (pp. 101–111). Springer. https://doi.org/10.1007/978-1-4614-3185-5_9
- Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge (TPACK)? *Contemporary Issues in Technology and Teacher Education, 9*(1), 60–70.
- Liveworksheets Website. (n.d.). Liveworksheets logo. https://www.liveworksheets.com/
- Lopez-Pérez, M. V., Pérez-López, M. C., & Rodríguez-Ariza, L. (2019). Blended learning in higher education: Students' perceptions and their relation to outcomes. *Computers & Education, 72*(2), 1–12. https://doi.org/10.1016/j.compedu.2018.12.001
- Mayer, R. E. (2009). *Multimedia learning* (2nd ed.). Cambridge University Press. https://doi.org/10.1017/CBO9780511811678
- Microsoft Teams Website. (n.d.). Microsoft Teams logo. https://www.microsoft.com/es-es/microsoft-teams/log-in
- Miro Website. (n.d.). Miro logo. https://miro.com/app/board/uXjVJfTjrS4=/?inviteKey=Vjd6YW01eXBvK1ZGWWo1NkcrSlN5cEUrdHJTeGZqekFrQW41Wk10YktDUmFUNHhGZmk1a25WV3kxd2hWT2ZsQ0dOR0ZVaS8yeHNQQmdDZWhWM21WR3dodlZiVDgxK0JGUlYxOS9jOGhENDJnUVFwNEZjTzhxY3BXUVBTTEJNcFR3VHhHVHd5UWtSM1BidUtUYmxycDRnPT0hdjE=

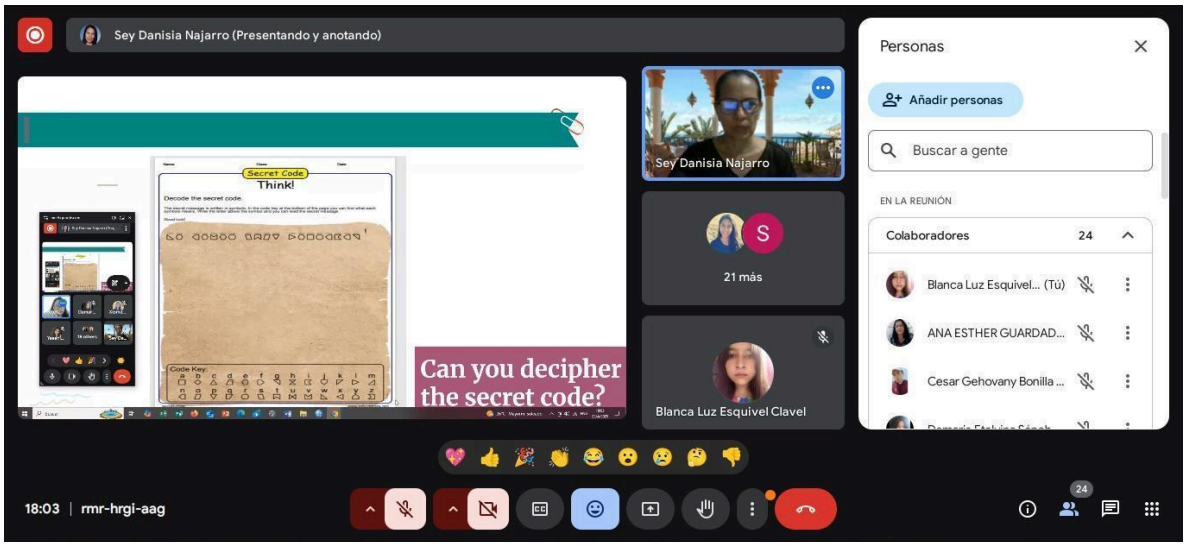
- Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 108*(6), 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x
- Muñoz-Carril, P. C., González-Sanmamed, M., & Hernández-Sellés, N. (2013). Pedagogical roles and competencies of university teachers in online learning environments: A theoretical and practical vision. *International Review of Research in Open and Distributed Learning, 14*(3), 462–487. https://doi.org/10.19173/irrodl.v14i3.1477
- Narakeet Website. (n.d.). Narakeet logo. https://www.narakeet.com/
- Nearpod Website. (n.d.). Nearpod logo. https://app.nearpod.com/presentation?pin=X6F4Q
- NotebookLM Website. (n.d.). Notebook logo. https://notebooklm.google.com/notebook/3f3321c6-9263-4d53-bb89-a8c569a5b34e?_gl=1*1kunn05*_ga*OTA3MjUzOTI0LjE3NTE1ODA1OTI.*_ga_W0LDH41ZCB*czE3NTE1ODA1OTIkbzEkZzEkdDE3NTE1ODA1OTIkajYwJGwwJGgw&original_referer=https:%2F%2Fnotebooklm.google%23&pli=1
- Pixabay Website. (n.d.). Pixabay logo. https://pixabay.com/es/
- PiZap Website. (n.d.). PiZap logo. https://www.pizap.com/app/login
- Powtoon Website. (n.d.). Powtoon logo. https://www.powtoon.com/
- ReduceImages Website. (n.d). ReduceImages logo.

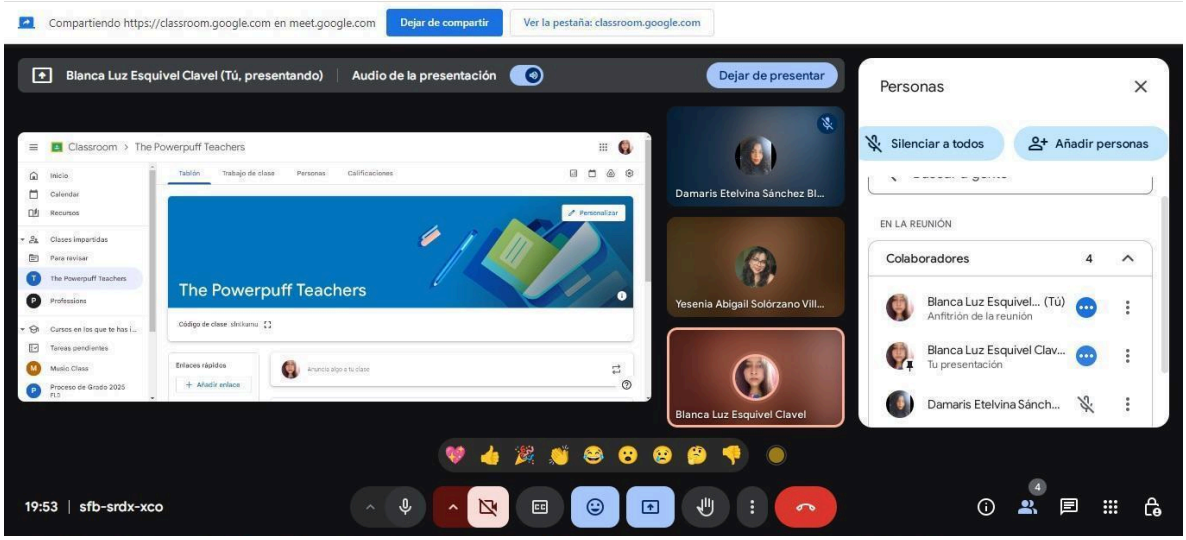
https://www.reduceimages.com/

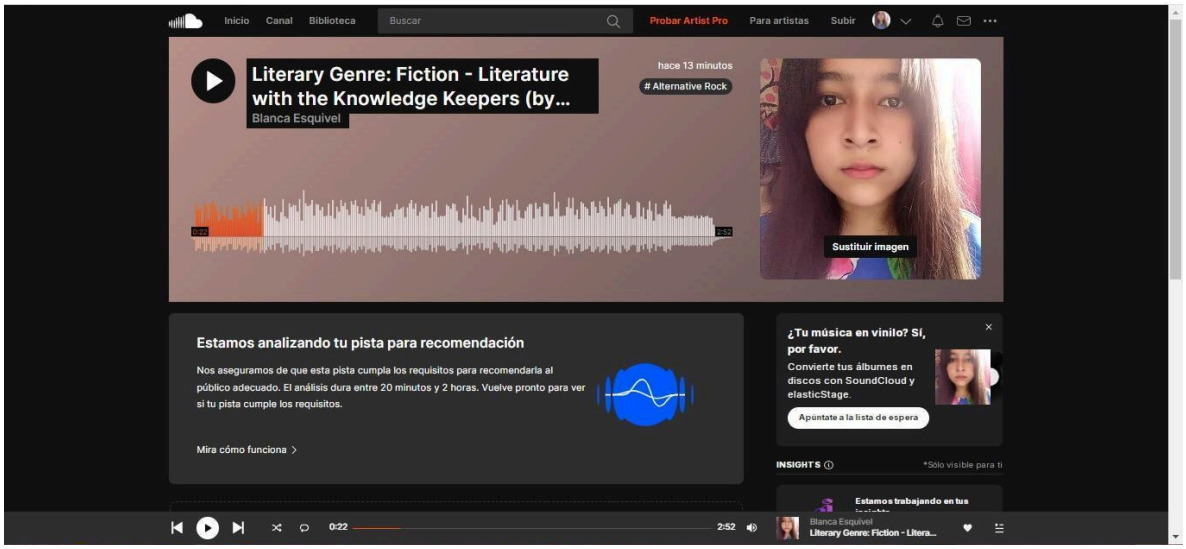
- Rienties, B., Giesbers, B., Lygo-Baker, S., Ma, H. W. S., & Rees, R. (2016). Why some teachers easily learn to use a new virtual learning environment: A technology acceptance perspective. *Interactive Learning Environments, 24*(3), 1–19. https://doi.org/10.1080/10494820.2013.834264
- Schmidt, D. A., Baran, E., Thompson, A. D., Mishra, P., Koehler, M. J., & Shin, T. S. (2009). Technological pedagogical content knowledge (TPACK): The development and validation of an assessment instrument for preservice teachers. *Journal of Research on Technology in Education, 42*(2), 123–149. https://doi.org/10.1080/15391523.2009.10782544
- Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15*(2), 4–14. https://doi.org/10.3102/0013189X015002004
- Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning, 2*(1), 3–10.
- SoundCloud Website. (n.d.). SoundCloud logo. https://soundcloud.com/es
- Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science, 12*(2), 257–285. https://doi.org/10.1207/s15516709cog1202_4
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

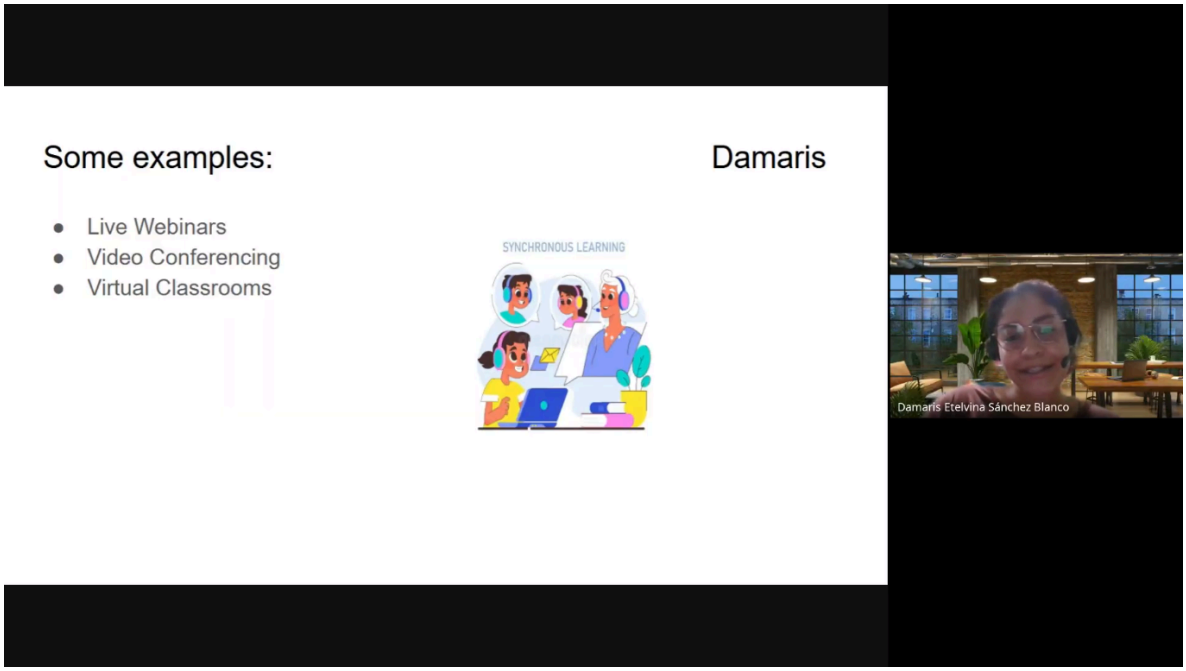
- Voogt, J., Fisser, P., Pareja Roblin, N., Tondeur, J., & van Braak, J. (2013). Technological pedagogical content knowledge – A review of the literature. *Journal of Computer Assisted Learning, 29*(2), 109–121.
- WordArt Website. (n.d.). WordArt logo. https://wordart.com/

# IX. APPENDIXES




Inicio
Canal
Biblioteca
Buscar
Probar Artist Pro
Para artistas
Subir
Literary Genre: Fiction - Literature with the Knowledge Keepers (by...
Blanca Esquivel
hace 13 minutos
# Alternative Rock
Sustituir imagen
Estamos analizando tu pista para recomendación
Nos aseguramos de que esta pista cumpla los requisitos para recomendarla al público adecuado. El análisis dura entre 20 minutos y 2 horas. Vuelve pronto para ver si tu pista cumple los requisitos.
Mira cómo funciona
¿Tu música en vinilo? Sí, por favor.
Convierte tus álbumes en discos con SoundCloud y elasticStage.
Apúntate a la lista de espera
INSIGHTS
*Sólo visible para ti
0:22
2:52


Some examples:
Damaris
Live Webinars
Video Conferencing
Virtual Classrooms
SYNCHRONOUS LEARNING
Damaris Etelvina Sánchez Blanco

## Summary: -Blanca

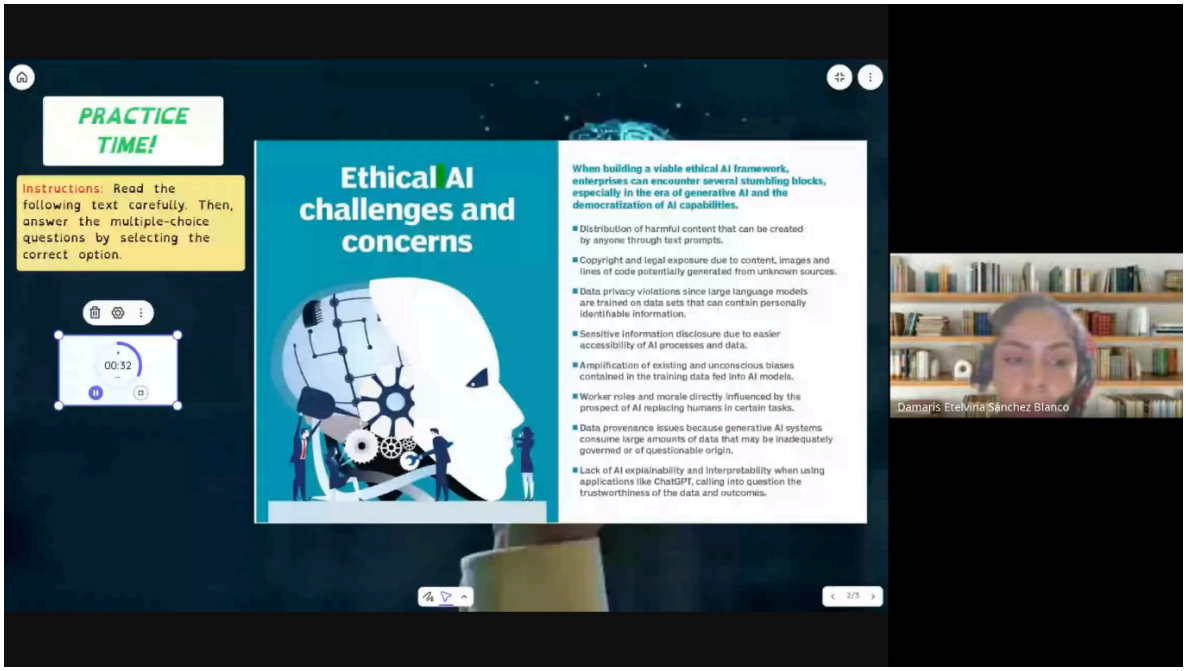
TPACK is a framework that helps educators understand and utilize technology effectively in teaching.

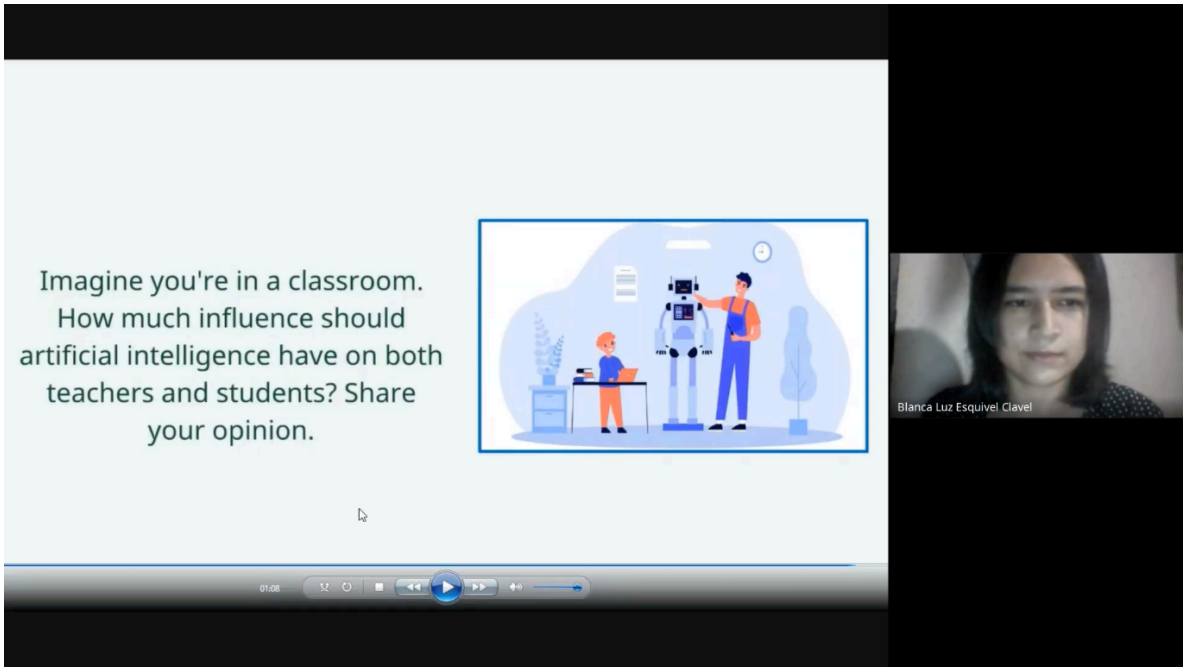
It focuses on the intersection between three key areas:

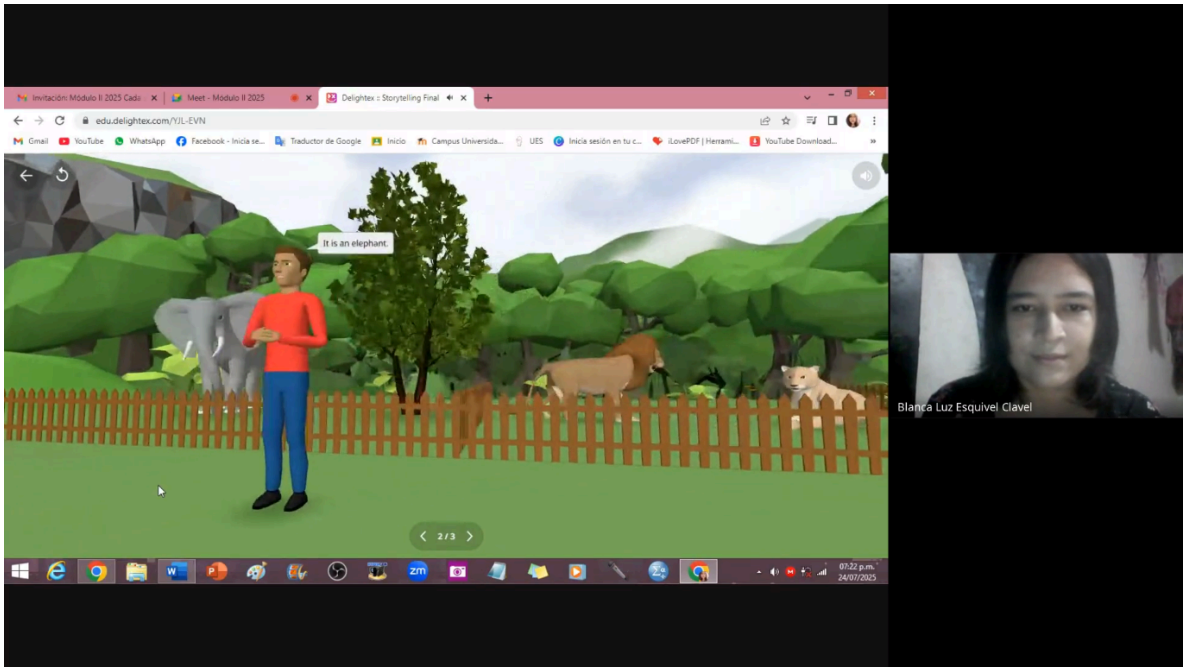
- Content knowledge (CK)
- Pedagogical knowledge (PK)
- Technological knowledge (TK)

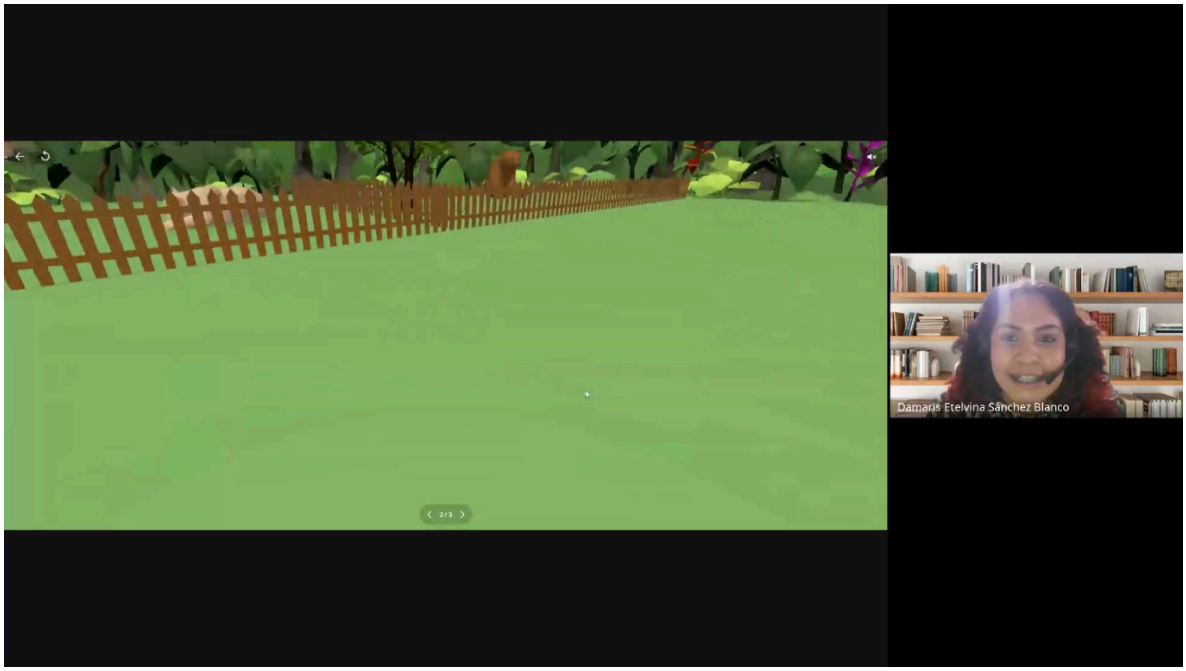
TPACK highlights how these three areas interact and influence each other in effective teaching.




PRACTICE TIME!
Instructions: Read the following text carefully. Then, answer the multiple-choice questions by selecting the correct option.
00:32
Ethical AI challenges and concerns
When building a viable ethical AI framework, enterprises can encounter several stumbling blocks, especially in the era of generative AI and the democratization of AI capabilities.
Distribution of harmful content that can be created by anyone through text prompts.
Copyright and legal exposure due to content, images and lines of code potentially generated from unknown sources.
Data privacy violations since large language models are trained on data sets that can contain personally identifiable information.
Sensitive information disclosure due to easier accessibility of AI processes and data.
Amplification of existing and unconscious biases contained in the training data fed into AI models.
Worker roles and morale directly influenced by the prospect of AI replacing humans in certain tasks.
Data provenance issues because generative AI systems consume large amounts of data that may be inadequately governed or of questionable origin.
Lack of AI explainability and interpretability when using applications like ChatGPT, calling into question the trustworthiness of the data and outcomes.
2/3
Damaris Etelvina Sánchez Blanco


Imagine you're in a classroom. How much influence should artificial intelligence have on both teachers and students? Share your opinion.
01:08
Blanca Luz Esquivel Clavel


It is an elephant.
2 / 3
Blanca Luz Esquivel Clavel


Damaris Etelvina Sánchez Blanco