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University of San Francisco

**Promoting 21st-Century Learning:
Online Collaboration through Design Thinking Framework
for Today's ESL Students**

A Field Project Presented to
The Faculty of the School of Education
International and Multicultural Education Department

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts in Teaching English To Speakers of Other Languages

By
Hande Yildiz
December 2020

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UNIVERSITY OF SAN FRANCISCO

Under the guidance and approval of the committee, and approval by all the members, this field project has been accepted in partial fulfillment of the requirements for the degree.

Approved:


Luz Navarrette García, EdD
Instructor/Chairperson

December 2, 2020

Date

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ABSTRACT

Learners of the 21st-century engage and learn differently than ever before. Policymakers and teachers are now challenged to makeshift into the 21st-century education model and adapt their approaches to better prepare the students for the future work world. 21st-century ESL classrooms should reflect this learning model through a more engaging, collaborative, and student-centered approach. Collaboration and Information and Communication Technology (ICT) skills are vital in 21st-century learning. Research shows that ESL learners can benefit from collaborative activities and the use of technology improves students' language reception and production. However, due to the lack of understanding of the paradigm shift in education, lack of teacher support, and time restrictions it is challenging for teachers to adapt their teaching approach to this new model. As a result, students are not engaged in their classrooms or well prepared for their future studies.

Due to the novel coronavirus, most classrooms have shifted to online teaching. Teachers need support in how to adapt their teaching into an online platform. Through online collaboration tools, ESL teachers can promote student engagement, 21st-century skills, and second language learning. The website in this project is created to support the knowledge and understanding of the ESL teachers who want to integrate a 21st-century approach to their current teaching practices. The website will be useful for ESL teachers to find resources on online collaboration and adapt their online teaching and/or improve their current one. A 21st-century framework; Design Thinking is also introduced with tools to help ESL teachers when promoting a meaningful collaborative learning model.

CHAPTER I INTRODUCTION

Statement of the Problem

Online collaboration and its application in K-12 classrooms are among the latest digital trends in the English as a Second Language (ESL) field. As new educational technologies have arisen for learning, they have brought many different rays of possibilities for students to learn and teachers to teach (Black, 2009). These abundant possibilities bring in new challenges and the need to change the existing curricula and instructional modes in the education field. Some of the challenges that are relevant to ESL classrooms vary from understanding the 21st-century learner's needs, the shift in the pedagogical approach, and the efficient use of emergent technologies. Collaborative work promotes 21st-century skills and language development; however, little work has focused on how to optimize effective collaboration (WIDA, 2014). Kessler et al. (2018) observe the support teachers receive to be inadequate, inappropriate, or outdated. Due to the outbreak of the novel Covid-19 and the sudden switch to remote learning, many teachers lack the necessary time to prepare for the new shift and many teachers are anxious about how to combine technology and collaboration (Dhawan, 2020).

Throughout my career as an ESL teacher in K-12, I have observed difficulties when trying to incorporate collaboration. My teaching experience as a teacher and grade level leader put me on a quest to find various ways of student interaction in and outside of the classroom. The search for alternative ways of student interaction is then shaped into the question of “How might we design an effective collaboration framework that best suits the needs of 21st-century

learners?” Curating an effective collaboration framework and then carrying it to an online platform required me to do extensive research on what today’s learning was about and how that would look like in an ESL classroom. Starting my research on 21st-century students’ needs, I wanted to deepen my understanding of the essential skills in preparing students for the unknown world as well as how to incorporate these essential skills outside the classroom walls.

Collaboration is one of the skills that I chose to focus on since it can include many other skills and open its doors to meaningful learning when done right. Collaborating in an online platform promotes the learning opportunity and student engagement to happen flexibly; synchronous or asynchronous and promotes self-directed learning. In completing my master’s degree, I wanted to address the current needs of ESL teachers and learners: Bringing the traditional classroom outside through understanding the 21st-century needs and maximizing the learning opportunities; particularly focusing on the collaboration aspect. Implementing these current changes and meeting the needs are not easy tasks for most ESL teachers since they require a lot of research and time commitment. My research project is an ultimate means to guide ESL teachers in theory and practice to equip them with the necessary tools and to prepare them for the changing and challenging needs of the 21st-century learning environment.

The changing nature of the classrooms in the 21st-century brings the need for how to effectively prepare students for tomorrow’s classrooms and how to transition our current one. To make these transitions, schools and educators must incorporate 21st-century skills and methods that are engaging and inspiring for students to learn (Apple Classrooms of Tomorrow, 2018). Moreover, failing to prepare young students for the current world’s needs has enormous consequences (2018). 21st-century learning brings along the need to equip the students with

future work skills. An in-depth collaborative study conducted by The Conference Board, Corporate Voices for Working Families, the Partnership for 21st Century Skills, and the Society for Human Resource Management in 2006 reported the most important skills of the 21st century that are necessary for the workplace (Casner-Lotto, 2005). Among them, “Professionalism, Oral and Written Communications, Teamwork/Collaboration and Critical Thinking/Problem Solving were the most important skills cited by the employers” (2005). According to Alber (2017) effectively facilitating a group is a 21st-century skill and is necessary for success in the work world. In particular, there is an increasing need for collaborative knowledge construction for future work life (Hämäläinen & Vähäsantanen, 2011).

Social Learning Theory developed by Vygotsky (1987) suggests that students produce new information as a result of their collaboration. Collaboration is one of the 21st-century skills that can prepare ESL learners for the 21st-century world and essential in language learning development (Kirsch, 2016). In fact, the role of teachers in designing collaborative environments for creative group work is increasing more than ever (Hämäläinen & Vähäsantanen, 2011). The study conducted by Leong, L.C., et al. (2018) accounts for how students can learn with the help of others through collaboration and the importance of collaborative learning behavior in a classroom setting when improving students’ academic outcomes. However, effective collaboration in ESL classrooms has been one of the most challenging tasks to implement. Teachers face difficulties when conducting collaborative learning tasks and creating collaboration tasks requires a commitment to the teacher’s side to be implemented effectively. (Gillies & Boyle, 2010). The study conducted by Gillies & Boyle (2010) highlights the need for teacher training in cooperative learning pedagogy and equipping the teachers with the necessary

skills to conduct collaboration. According to Kessler (2018), “We need to intentionally prepare teachers who are already likely to bring extensive participation in social networks and are comfortable investigating a range of emerging technologies to go beyond what is provided by their textbook and create exciting experiences for tomorrow’s language learners.” Furthermore, research elucidates the need for training teachers on collaborative learning design and practice (Gillies & Boyle, 2010; Hämäläinen & Vähäsantanen, 2011; Le, Janssen & Wubbels, 2018).

Within the existing literature, there is valuable data on 21st-century skills, collaborative learning, and their positive impact on language learning. An important gap identified in the literature is the lack of support and encouragement teachers seem to have when using increasingly familiar tools in the context of teaching (Kessler, 2018). Kessler, Williams, Abraham & Bostelmann (2014) observed the lack of preparation teachers receive. Besides, many teachers are still unaware of the use of Computer Assisted Language Learning (CALL) in the classrooms this is partly because of the personal attitude and policies determined by governments (Kessler, 2018). There is a persisting challenge for teacher preparedness for technology use in language education. A report conducted by Pew Research Center in 2013 shows that 47% of teachers surveyed “strongly agree” and another 44% “somewhat agree” that “courses or content focusing on digital literacy must be incorporated into every school’s curriculum.” Many studies highlight the lack of teacher preparedness and the importance of teacher education in ICT usage (Adams, 2020; Kessler, 2018; Kirsch, 2016). Teachers need to be equipped with training materials to promote 21st-century skills including collaboration in their ESL classes.

In addition to the lack of teacher preparedness for technology use, with the outbreak of novel COVID-19 and the sudden shift to teaching online, most teachers did not have the

transition time and training opportunity to effectively promote online collaboration among students. Adams (2020) reported that “the varying amount of training districts has created a patchwork of quality and gaps in accessibility.” Lack of preparedness resulted in teachers to improvise while transitioning to online learning (Adams, 2020). Another problem with the quick transitioning is the lack of training time on building online collaboration systems that are engaging and effective. In Adam’s (2020) article, the chief executor officer of The International Society for Technology in Education (ISTE) reported that “many districts are rushing onto the new platform and scanning worksheets for kids to do online – not building engaging, effective online learning.” While making online learning possible, its effectiveness should also be carefully planned. Dhawan (2020) demonstrates that there is a need for dynamic, interesting, and interactive online engagements where the emphasis is on pedagogical issues and collaboration. The purpose and context of the technology adaptation should be clear (Dhawan, 2020), but doing so is no small task. Loeb (2020) highlights the need for a strong curriculum and pedagogical practices in designing online courses.

Despite the growing body of evidence that demonstrates the importance of student collaboration and the need for technology integration in education, there is little research on how to promote an effective online collaboration environment among primary level ESL students. This creates discrepancies in the effective implementation of online ESL classes and student collaboration and the learning cannot go beyond traditional teacher-centered instruction. In an ESL environment, collaboration is fundamental when learning a language (WIDA, 2013). Promoting effective online collaboration in ESL classes requires research and structured planning. Most ESL teachers are not equipped with the necessary knowledge, tools, and lack the

time for training (Le, Janssen and Wubbels, 2017). Moreover, teachers do not get enough support from the administration and policymakers for training opportunities (Hämäläinen and Vähäsantanen, 2011).

Purpose of the Project

The focus of the website developed in this project is to guide primary level ESL teachers in promoting effective online collaboration approaches to meet the needs of 21st-century learners through the Design Thinking framework. Consequently, it will deepen the online collaboration knowledge and skills of ESL teachers so that they can effectively conduct online collaboration and improve the efficacy of student interactions. It will equip the teachers with the knowledge of preparing students for the 21st-century learning and skills, understanding the Design Thinking framework, and utilizing this framework to promote effective online collaboration. This project seeks to address the issue of effective and meaningful collaboration through Design Thinking, a framework for effective collaboration.

Design Thinking is a “human-centered approach to learning, creating, and being through empathy” (Cantwell, 2010). Design thinking “meets the crucial criteria for effective 21st-century learning by facilitating interdisciplinary projects, approaching complex phenomena in a holistic constructivist manner” (Scheer, Noweski, & Meinel, 2009). Through understanding the design thinking framework and utilizing the suggested online tools, this project aims to prepare teachers to efficiently plan on further online collaborations. Using the design thinking framework will also help ESL teachers to better monitor students’ progress by putting the students in the center, at the same time allow the teachers to also work together with the groups when needed. Design

thinking toolkits and sample lessons are provided as a resource for teachers to access for future collaborative planning.

The constructivist and communicative based approach represented in this project will help students to produce information through collaboration. Vygotsky's (1978) Social Theory stresses the importance of community and social interactions when making meaning and how new information forms as a result of collaboration among students (as cited in McLeod, 2020). Looking through the lens of Vygotsky's (1978) Social Theory, this project aims to promote effective social interactions as a means to create new information among ESL students.

Theoretical Framework

The theoretical framework for this field project is based on the following theories and methodologies: Vygotsky's (1978) Zone of Proximal Development and Social Theory, Constructivism (Dewey, 1931), and Design Thinking Cycle (Simon, 1969). Vygotsky's (1978) theory suggests that producing new information is the result of collaboration. The Zone of Proximal Development is a bridge to building active learning communities through an understanding of social learning theory. "It is the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers" (1978). The theory of the Zone of Proximal Development stresses the role of social interaction and the role of community in building cognition. In the learning of language, Vygotsky's theory focuses on the influences of collaboration for communication. In a 21st-century education model, collaboration is key to preparing students for the future.

Constructivism in an ESL classroom today can be seen as an inquiry or project-based approach. John Dewey's (1938) Constructivist philosophy recognizes learning as a social experience. This progressive education formulation outlines the importance of interaction in the application of knowledge (Hein, 2019). In this type of education, teachers have the role to regulate this social experience to promote an environment where there is a "growth for capacity, arousal of curiosity and strengthening initiative" (McCance, 2016).

Lastly, the Design Thinking Cycle by Simon (1969) will be used as a framework to deliver the pedagogical approach in the collaboration cycle. Simon's (1969), search for design possibilities on "how things might be" provided the foundation of creating a design thinking cycle which later on was adopted by companies for collaboration, and within the last years by educators as a framework for effective collaboration.

Significance of the Project

The use of newly emerged technology in the 21st century is changing the experience of students and teachers. This new experience is also now bringing its challenges into the education field. Teachers of the 21st century need effective teaching and systems where the emphasis is not just on what students learn, but also how they learn. Understanding the paradigm shift in the educational field from positivism to post-positivism is important to understand and implement this change (Jacobs & Farrell, 2001). There is a need for teachers and policymakers to gain perspective on what new skills students need to develop in this post-positivist approach. Teachers and policy-makers need to acknowledge this shift in education and adapt their methodologies and approaches to this new model. Black (2009), highlights that activities based

on new technologies and ICTs can provide opportunities for the development of language proficiency and 21st-century skills.

The impact of the changing environment in teaching and learning is now bringing new ways of learning and teaching opportunities. There is a need for a high level of preparedness to adjust to various situations such as; online learning or pandemics (Dhawan, 2020). However, to make e-learning efficient, there should be a focus on the effective use of technology (Dhawan, 2020). Many studies highlight the need and importance of teacher training and support for efficient teaching and learning practices (Adams, 2020; Dhawan, 2020; Kessler, 2010; Kessler, 2018; Kirsch, 2016).

Finally, due to the outbreak of the novel Covid-19 and the sudden switch to remote learning, many teachers lack the necessary time to prepare for the new shift and many teachers are anxious about how to combine technology and collaboration. This project is planned to ease teachers' anxiety by equipping the teachers for future lesson plannings and making online collaboration happen efficiently.

The developed website may be a useful resource for ESL teachers who want to adapt their teaching into a 21st-century learning environment and promote online collaboration through the structured design thinking framework. Due to the ever-changing nature of the technology and its future tools and apps, this project will not focus specifically on technology tools or apps, but the design framework to guide the ESL teachers and ways to use these sample frameworks online. The ultimate goal is to help ESL teachers understand the 21st-century learning model and to guide how the design thinking framework could be utilized to promote online collaboration. It might also benefit policy-makers who want to promote an educational model that is suited for

21st-century learning. Finally, this project can help students to develop their ESL skills and attain their 21st-century skills.

Limitations

This website is designed to guide ESL teachers and policymakers on the 21st-century learning, technology, online collaboration, and design thinking framework. While the content provides a brief description and understanding of this learning model, the tools provided on this content provide a more general understanding. Therefore, the number of tools and activities provided on the website serve as a model. The activities and tools provided on this website are for intermediate to advanced levels of ESL learners. It is important that ESL teachers make alterations according to the level, skills, and needs of the students. Some of the online whiteboard collaboration tools presented on this website are subscription-based. At schools where funding is limited for such resources, ESL teachers may not be able to use the desired whiteboard collaboration tool. In addition, the links on this website are privately maintained. Therefore the continuation of these links in the future may vary.

CHAPTER II REVIEW OF THE LITERATURE

Introduction

Students of the 21st-century engage and learn differently than ever before. 21st-century learning brings the need to adapt our current pedagogy and practices into one which focuses on not just what students learn but how they learn. In the English as a second language (ESL) world, the 21st-century shift refers to moving beyond “language” in classrooms, incorporating 21st-century skills set and integration of Information and Communication Technologies (ICT). One way to promote 21st-century skills in ESL classes is through collaboration. Collaboration is one of the key 21st-century skills in the ESL context and can also be conducted online to improve ICT skills. In ESL classrooms, teachers need effective collaboration practices in order to promote 21st-century skills and language development.

Due to the novel Covid-19, almost all classes were carried to online instruction. A fact sheet released by the Department of Education on distant learning urged states to continue educating students through distance learning options (U.S. Department of Education [ED], 2020). However, with the quick shift, teachers did not have enough time to prepare for online instruction and lacked support to make the necessary adaptations into their teaching practices. Moreover, there is little research on how to help ESL teachers to promote effective online collaboration. Failing to incorporate student collaboration both in-class and online will prevent ESL students from practicing interaction and their communicative language skills. In addition, students will not be able to improve their 21st-century skills, which are essential to prepare them for the work world. Even though collaboration is important in language learning and

development, most teachers do not have the necessary training and tools on how to effectively promote online collaboration.

The purpose behind using this literature review is to provide enough evidence to support the claim that there needs to be a resource for ESL teachers on promoting 21st-century skills and how Design Thinking might be used as a tool for facilitating online collaboration. This literature review will focus on three themes with their subcategories. The first theme is the 21st-century learning shift and theories in ESL teaching, the second theme is technology as a tool to develop 21st-century skills in ESL classrooms. The second theme is supported with the sub-themes of teacher preparedness and lack of teacher support. Finally, the third theme is 21st-century learning practice: Design Thinking as a framework for online collaboration. Each section will embed the relevant theory to provide background information and studies within ESL.

21st-Century Learning Shift and Theories in ESL

A Paradigm Shift and the Need For A Change

Numerous studies highlight the importance that there is a need for a change in the educational field (Kuhn, 1970; Jacobs and Farrell, 2001; Eaton, 2010). Understanding the paradigm shift in the educational field from positivism to post-positivism is important to understand and implement this change.

Thomas Kuhn coined the term *paradigm shift* to define change and practice. Kuhn (1970) explained how paradigms help scientific communities by creating avenues of inquiry, formulating questions, selecting methods with which to examine questions, defining areas of relevance, and establishing/creating meaning. In the *Structure of Scientific Revolution* book, Kuhn (1970) provided insights about thinking about the change in education. In the educational

context, the paradigm shift generates a broader understanding of how education has moved from the instruction paradigm to a learning paradigm. Kuhn's pioneering work on paradigm shift established the stepping stones for inquiry and change. In the second language education context, this shift from positivism to post-positivism refers to a more contextualized, meaning-based view of language. Positivism holds a top-down approach (Jacobs & Farrell, 2001) and relies on the inductive method to reach the objective reality.

Jacobs and Farrell (2001) illustrated ten key components in second language education relevant to the paradigm shift: the shift of attention from teacher-centered approach to learner-centered approach, the focus on the learning process rather than a product, the importance of diversity among learners and recognizing them, student voices, the value of holistic learning, helping students to understand and develop the purpose of their learning, the focus on the whole rather than a piece, the emphasis on the importance of meaning, and learning as a lifelong process.

In their study, Jacobs and Farrell (2001) enumerated eight changes as part of the paradigm shift in the second language classroom implications:

- 1. Learner autonomy*
- 2. Cooperative learning*
- 3. Curricular integration*
- 4. Focus on meaning*
- 5. Diversity*
- 6. Thinking skills*
- 7. Alternative assessment*
- 8. Teachers as co-learners*

Learner autonomy is closely related to Vygotsky's (1978) concept of self-regulation and it refers to being able to have some choice in what they learn and the way they learn (Jacobs & Farrell, 2001). In the context of second language classroom implication, learner autonomy provides the choice of who the students interact with. For example, collaboration among learners can promote self-directed learning, without having to depend on the teacher.

Jacobs and Farrell (2001) advanced the idea that the paradigm shift had not been implemented as widely or as successfully due to piecemeal approaches implemented by educators and/or stakeholders rather than a holistic approach. According to Brown (1994, as cited in Jacobs & Farrell, 2009), one important factor is that the teaching methodology and assessments do not move forward in the same fashion. Even though second language teaching methods move toward a more communicative approach, the focus on tests is still on form rather than meaning (Jacobs & Farrell, 2009). In order to move beyond, Jacobs and Farrell underscore the importance of teachers as co-learners. As the changes challenge so many teachers, it is vital that teachers share their knowledge with one another to help the field develop (Jacobs & Farrell, 2009).

Similarly, Eaton's (2010) study in the field contributed to the need to change in the second language education field. Eaton (2010) stated that current teaching methods are outdated. According to Eaton (2010) students in the 21st-century learn globally and technology plays an important role in the way the students learn a language.

The studies of Kuhn (1970), Jacobs and Farrell (2001), and Eaton (2010) contribute to the understanding that the change is inevitable in the 21st-century educational field both in learning

and teaching and thinking about the change in education is the first step to make this shift happen.

P21 Framework

21st-century learning refers to designing learning according to the needs of 21st-century learners and equipping them with the skills that prepare them for the work world. The pioneering movement for implementing this change was Partnership for 21st Century Learning referred to as the P21 Framework. P21 is a coalition of the US Department of Education, various tech companies including Apple, AOL, Microsoft, Cisco, and educational organizations (Remakelearning, 2016). P21 framework model incorporates 21st-century skills that learners must master to flourish in work and life. The framework is a combination of content knowledge specific skills, expertise, and literacies (California Department of Education, 2019). The essential skills include: “Learning and Innovation Skills (The Four C’s: Critical thinking, Communication, Collaboration, and Creativity), Life and Career Skills, Information, Media and Technological Skills” (California Department of Education, 2019).

The research project Apple Classrooms of Tomorrow—Today (ACOT2), sponsored by Apple Computers elucidated six design principles in 21st-century learning: *21st Century Skills and Outcome, Relevant and Applied Curriculum, Informative Assessment, A Culture of Innovation and Creativity, Social and Emotional Connections with Students and Ubiquitous Access to Technology* (ACOT2, 2008). A report by ACOT2 (2008) stressed the importance of new and creative ways of thinking in order to make an educational reform. Another point ACOT2 (2008) discussed is that there is a need for students to access information and technologies that engage the learners for data gathering with various media instruments. In

addition, ACOT2 (2008) highlighted the importance of communicating the data and how that aids in promoting collaborative work.

In this part of the chapter, the theories introduced and most relevant to the 21st-century ESL teaching and the designed project are Social Development Theory/Zone of Proximal Development, Collaborative Learning, and Computer-Mediated Communication.

Social Development Theory/ Zone of Proximal Development

Lev Vygotsky's Social Development Theory has provided the foundational work for many research in cognition and the development of knowledge in the learning context.

Vygotsky's "Social Development Theory views human development as a socially mediated process in which children acquire their cultural values, beliefs, and problem-solving strategies through collaborative dialogues with more knowledgeable members of society" (1934, as cited in McLeod, 2020). Vygotsky's theories (1978 as cited in McLeod, 2020) emphasized the importance of social interaction for cognitive development and the essential role of community when "making meaning."

In the educational implication, Zone of Proximal Development (ZPD) is one of the themes within the Social Development Theory and Vygotsky (1978) defined ZPD as "*the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers*" (p. 86). In ZPD theory, Vygotsky (1978) suggested that his theory aids educators as a tool in the understanding of the developmental processes in cognition that are currently in the state of formation. Moreover, Vygotsky (1978) discussed that what is at the ZPD today, will be what a child can do by herself tomorrow, which

opens the doors to potential cognitive development through collaborative learning processes. According to Vygotsky (1978 as cited in McLeod, 2020), in a classroom context, the construction of knowledge is shown as a result of the collaborative nature of learning.

Vygotsky's ZPD theory also draws implications on the social-language aspect. Wells (1999) indicated in Vygotsky's (1978) theory, language is also identified as "the tool of tools" as a medium not merely useful to facilitate social activity, but to promote participants "to plan, coordinate and review their actions through external speech". Language learners can specifically benefit from the social interaction aspect in ZPD through the use of planning, coordinating, and problem-solving.

According to Wells (1999) scaffolding is defined as a way of operationalizing ZPD. Additionally, scaffolding is important to provide comprehensible input to ESL learners in their second language acquisition (Shoebottom, n.d.) and serves as a guide to support the learner's ZPD through the help of the teacher or more competent peer (McMillan, 2020). Specifically, Aljaafreh and Lantolf (1994 as cited in Lee, 2015), underline the importance of the usage of ZPD in that it encompasses the learner, the teacher, their relationship and shared experiences, and the resources for the facilitation of the learning. Lee (2015) observed that in ESL classrooms, the interactive learning aspect of ZPD is beneficial in that it is learner-centered, engages learners, and promotes the development of language as well as problem-solving skills and reflective thinking.

Various studies presented the effectiveness of ZPD in educational implications. It is imperative for teachers how understanding ZPD can aid in building future knowledge and skills in children. In ESL classrooms Vygotsky's formulation of ZPD can provide insights into

pedagogical applications when designing learning opportunities. Considering the learning aspect, the impact of grouping learners and facilitating collaboration is substantial when making meaning. Wells (1999) indicated that ZPD can be achieved by creating a classroom environment that is open to sharing, collaboration, and dialogic inquiry. In addition, Wells (1999) recommended implementing an inquiry-based curriculum that encourages learners to ask questions and collaboration among learners in building knowledge.

Collaborative Learning

Goodsell, Maher, Tinto, Smith, and MacGregor (1992) defined collaborative learning as a change agent in the learning environment where students are the active participants of making meaning. Cooperative learning is also another name used for collaborative learning to define this type of structured activities. Similar to collaborative learning, Holubec (1990, as cited in Goodsell et al., 1992) defined cooperative learning as “the instructional use of small groups so that students work together to maximize their own and each other’s learning”. Both cooperative and collaborative learning promote social skills through their construction of knowledge by working together (Goodsell et al., 1992). In order for learning to happen in a collaborative learning activity, challenging tasks or questions are necessary which require problem-solving and high order thinking skills (Goodsell et al., 1992). Through the process of new ideas and collaborative work, students can create new meaning which leads to learning. Goodsell et al. (1992) described the teacher role to be less lecture-centered in collaborative learning and learning is an active process where students work purposefully to construct knowledge through their intellectual processing.

One advantage of collaborative learning defined by Goodsell et al. (1992) is the diverse perspectives within the learning community that help bring multiple perspectives to the learning environment. Collaborative learning also supports the learners to become life-long learners through listening to others and developing their own points of view (Goodsell et al.,1992).

In ESL, collaborative learning has been studied in many different contexts. Hämäläinen and Vähäsantanen (2011) highlighted the creative aspect of collaborative learning in educational settings. In addition, Kirsch (2016) confirmed that through collaborative storytelling, the more knowledgeable children promote input and comprehension which scaffold the learning. WIDA Consortium (2013) identified the benefit of group work among English language learners (ELLs). Group work allows the exchange of ideas within the groups and the proficient members provide language development through communication (WIDA Consortium, 2013). Through the collaborative act of making meaning for open-ended questions, learners facilitate their language acquisition (WIDA Consortium, 2013).

Collaborative learning has a significant impact on improving student learning; however, teachers are challenged to adapt to collaborative learning approaches (Goodsell et al.,1992). The teachers are mostly challenged about the changing dynamics and roles of teachers and students as well as the way content is delivered. Le, Janssen, and Wubbels (2017) studied effective collaborative learning practices and their findings indicated that when assessing productivity, teachers focused more on the individual work rather than the group. Le et al. (2017) commented that assessing individual productivity does not promote collaborative performance. In addition, a lack of knowledge in what to assess and how to assess in collaborative work creates ambiguity in the quality of assessment (Le at al., 2017). Le et al. (2017) indicated that teachers are challenged

to assess the collaborative work based on students' final product. The findings of Le et al. (2017) highlight the importance of the lack of teacher training and tools in implementing effective collaborative learning and its impact on students' learning. Moreover, a study conducted on the implementation of cooperative learning by Gillies and Boyle (2010) revealed the importance of teacher training in cooperative teaching skills. WIDA Consortium (2013) recommended that teachers take into account creating opportunities for learners to exchange ideas in order to facilitate making meaning. Open-ended questions and group-work based activities should be considered instead of fact-focused and individual activities (WIDA Consortium, 2013). Moreover, research reflected that there is a need for platforms for teachers to conduct research-based collaboration activities and it is crucial to support teachers in orchestrating collaborative learning (Hämäläinen & Vähäsantanen, 2011).

Goodsell et al., (1992), Hämäläinen and Vähäsantanen (2011), Kirsch (2016), WIDA Consortium (2013), Gillies and Boyle (2010), and Le et al., (2017) studied the benefits of collaborative learning. Collaborative learning provides teamwork skills, high-order thinking, problem-solving skills, and 21st-century skills. Through collaboration, English language learners promote interaction with their peers and use language as a tool within a meaningful context which adds a purpose in the usage of language. In addition, collaboration is one of the essential skills in the 21st-century to prepare learners in the outside world. ESL teachers need to be equipped with conducting effective collaborative practices in their classroom environment in order to develop language acquisition and 21st-century skills in learners.

Computer-Mediated Communication

Computer-Mediated Communication (CMC) is an umbrella term to define the act of communication through the use of computers (Simpson, 2002). CMC can take place synchronously and asynchronously where the interactions vary from “*text-based online chat, computer, audio and video conferencing or through the use of discussion forums and mailing lists*” (Simpson, 2002, p. 414). Since the 1980s, CMC has provided opportunities for language teachers and learners (Simpson, 2002). CMC provides an environment for student collaboration and interaction. In CMC, learners develop autonomy and are at the center; the role of the teacher shifts as an e-moderator (Simpson, 2002). Savignon and Roithmeier (2004) identified that computers redefined our communicative activities. Communication strategies play an important part in communicative activities and Computer-Mediated Communication (CMC) allows us to use more of the communication and learning strategies that provide opportunities to learn (Savignon & Roithmeier, 2004). CMC projects are claimed to encourage independent learning and taking responsibility for their own learning (Savignon & Roithmeier, 2004). It is claimed that in CMC, strategies used by other participants create opportunities for other learners to adopt similar strategies in their own communication (Savignon & Roithmeier, 2004). Studies observed that CMC offers a contemporary medium of communication to develop cross-cultural exchange and collaboration (Savignon & Roithmeier, 2004). Computer-Mediated Communication has been studied in the ESL context and has been proven to support ESL learning.

Ozdener and Satar (2008) indicated that CMC could benefit the less proficient ESL learners who have high affective filters. Moreover, it can be promoted as a tool in distance learning and act as a platform where communicative activities can continue outside the

classroom (Ozdener & Satar 2008). According to Belz and Thorne (2006), CMC provides a digital text record of speech which helps to develop the writing aspect of language and the scripts can be studied after they are typed. This helps the learner to bring language awareness due to the visibility of the text typed. A study conducted by Volle (2005) analyzed speaking skills in foreign languages through the use of voice e-mail and online interviews. The findings confirmed that online oral tasks provided improvement in speaking skills. Nguyen (2008) highlighted that CMC supports active learning, through the information making as part of their learning process. In language acquisition, according to White (2007, as cited in Nguyen, 2008) creating active learning where the students are at the center, is a vital part of creating an effective online language learning environment.

Studies of Simpson (2002), Savignon and Roithmeier (2004), Ozdener and Satar (2008), Belz and Thorne (2006), Volle (2005), and Nguyen (2008), support the reasoning that CMC is an effective tool to promote second language development in written, oral and comprehension skills. In addition to the language development aspect, CMC is also a powerful tool to support learners for reflection skills and help the learners become self-reflected learners.

Technology as a Tool to Develop 21st-Century Skills in ESL Classrooms

As new educational technologies have arisen for learning, so do many different possibilities for students to learn and teachers to teach. One example of this is a study finding from Eaton (2010) on 21st-century learning. Eaton demonstrated the change in the 21st-century and the need to change by stating the current classroom needs. As seen in Eaton, those needs are: student-centered approaches and the need for learner autonomy and cooperative learning (Jacobs

& Farrell, 2001). The findings of Eaton (2010) reflected that learners of the 21st-century are experiencing a world from technology using their cultural and language knowledge to communicate globally. Through technology, students in the 21st-century are eager to make connections with the world around them and they use their language and cultural skills to facilitate communication. Furthermore, Eaton's (2010) study illustrated the impact of technology on research in English as a Second Language field. The findings of Eaton's (2010) study highlighted that in 21st-century learning, portfolios are done entirely using technology. Student-made blogs, student blogs, wikis, and podcasts are some of the trends that are in (Eaton, 2010). In addition, the realm of student portfolios and the trend in student self-assessment and learner-centered approaches are gaining popularity (Eaton, 2010).

Similarly, Black (2009) demonstrated that popular media and new technologies can help ELLs develop both print literacy and 21st-century skills. Through technology, Black (2009) indicated that ELLs develop new literacy skills and active producers of language. One important skill Black (2009) suggested is digital literacy skill. Students use fan fiction texts, online discussion boards, social networking sites, fan communities, and video gaming in online spaces. Black (2009) observed the use of digital literacies by adolescents and their effectiveness when learning a language.

Leong et al. (2018) examined the positive effects of learning space design and teaching strategies on the students' collaborative learning behavior in a Mobile X-Space classroom. Leong et al. (2018) revealed how both technology and classroom design can be used to impact the classroom setting, creating an active collaborative environment for students. For example; a flexible layout, integration of technology, furniture for utility, and light-filled environment are

some of the essential components in a classroom that can be incorporated to create an environment that allows student collaboration (Leong et al., 2018). In addition to an active environment, the study by Leong et al., (2018) indicated that this type of classroom design also contributes to changing student behavior by providing better engagement in group discussions.

Moreover, Terrazas-Arellanes et al. (2017) established a new line of research to focus on inequity and individual variables through effective technology practices: The use of emerging technologies to fill the gaps of inequality and marginalization. Terrazas-Arellanes et al. (2017) showcased effective technology practices in classrooms can strengthen the linguistic skill development of students with learning difficulties (SWLD) and English learners (ELs). For example, ELs struggle with science due to their language proficiency needs, and SWLDs have difficulties with language, reading, math, and unstructured learning environments. Through the use of effective technology practices, SWLD and ELs can be supported to promote new knowledge and develop scientific thinking skills (Terrazas-Arellanes et al., 2017).

The studies of Eaton (2010), Black (2009), Leong et. al (2018), and Terrazas-Arellanes et al. (2017) support the reasoning that the emerging educational technologies have changed the dynamics of the nature of learning and teaching in the 21st-century in a positive way. It expanded ways of teaching in the classroom for teachers since the students' are now learning differently than ever. The contribution of the studies to the field broadens the understanding of emerging technologies, new perspectives, and effective practices in the classrooms. It can be concluded that technology acts as an aid to provide equity in learning for SWLD and ELs and promotes a learner-centered approach in student work, digital literacy skills, and collaboration among students.

Mobile-Assisted Language Learning (MALL) Practices in ESL Classrooms

Studies reveal the use of technologies, generating activities based on new technologies and ICTs provide opportunities for the development of language proficiency and 21st-century skills. Mobile-Assisted Language Learning (MALL) has been studied and found to reflect positive effects of language learning. Yang's (2013) study on effective mobile assisted language learning in the classroom assessed the pedagogical benefits and challenges of newly emerging and integrated mobile technology. For example; instructors can teach short English lessons via mobile phone by sending them to students' emails. A powerful spaced repetition software (SRS) SuperMemo can be used to teach vocabulary. Microblogging or mobile-blogging can help EFL learners to produce the language actively as well as enabling them to interact in the target language with the computer and mobile phone platforms. Moreover, Yang's study showcased that effective practices of technology can also reduce EFL learners' anxiety and promote better motivation.

Similarly, the research developed by Lan, Sung, and Chang (2007) demonstrated that mobile technology benefits collaboration in elementary EFL learners. Lan et al., (2007) examined the traditional EFL reading activities, their weaknesses and showed ways to improve it through the use of mobile technology. Lan et al., (2007) demonstrated that the implementation of Tablet PCs supports collaborative learning in elementary EFL learners. The study by Lan et al., (2007) revealed that the integration of computer technology can be used to solve the problems in collaboration when conducting traditional reading activities.

Finally, Muchtar's (2017) examination of different studies and their effectiveness showcased the use of mobile devices in developing learners' English proficiency. Muchtar

(2017) indicated that the application of mobile technologies strengthens the oral grammatical accuracy of ESL students. The study showcased mobile technologies have a positive impact on language education and that ESL applications are effective because they provide a personal and learning-center opportunity with accessible and flexible activities that encourage learners to develop life-long learning habits (Mughtar, 2017). Moreover, Mughtar (2017) revealed many advantages with mobile learning; mobile learning motivates learner engagement in the learning process as it offers flexible learning opportunities, keeps learners stay focused, manages their studies better, and facilitates their own learning.

The studies of Yang (2013), Lan et al., (2007), and Mughtar (2017) provided implications of MALL practices and how they can be used in various language teaching applications in the field. The studies above elucidated that MALL activities enhance language learning and motivation and have positive effects on learner autonomy. The evidence in this section illustrated the use of MALL as a path to developing second language proficiency. The next section will discuss the lack of support teachers receive when using technology in the classroom.

Teacher Preparedness and the Need for Teacher Support

Studies hold important implications of technology in the educational field. Kessler's (2018) study observed the lack of support and encouragement teachers seem to have when using these increasingly familiar tools in the context of teaching. The study indicated that there is a gap and a persisting challenge for teacher preparedness for technology use in language education (Kessler, 2018). In another study, Kessler (2007) observed that there is a general lack of computer-assisted language learning opportunities in teacher preparation. There is evidence that the teachers obtain their computer-assisted language learning (CALL) knowledge through

personal experience rather than a formal preparation (Kessler, 2007). Unlike using CALL in the classrooms, teachers in the field of teaching English to speakers of other languages (TESOL) are not as confident when creating materials that require the use of technology (Kessler, 2007). In addition, Egbert, Paulus, and Nakamichi's (2002) research on CALL activities indicated that the teachers do not use CALL activities due to lack of time, administrative or curricular restrictions, or lack of resources. The findings also demonstrated that there is a need for more contextualized instruction directly related to the teaching environments. Furthermore, Williams, Abraham, and Bostelmann (2014) studied the need for future teachers to learn how to think about, analyze, and integrate new technologies into a language curriculum. The study reflected that teacher preparation is inadequate, inappropriate, or outdated (Williams et al., 2014).

Moreover, the studies of Howlett and Waemusa (2019) contributed to the attitudes of the policymakers toward mobile devices in the education field. The implication of the study demonstrated that there is a growing concern of in-class mobile device use in Thai-ESL classrooms. Due to the increased concern, the Thai government restricted the use of mobile devices in the classrooms. Although technology adaptation may vary between cultures, negative attitudes towards technology may account for the lack of acknowledgment of the 21st-century change. As a result, teachers may not get the support they need and meet the needs of 21st-century learners.

Kessler (2007), Kessler (2018), Egbert, et al., (2002), Williams et al., (2014), and Howlett and Waemusa (2019) reflected that teachers' usage and integration of CALL technologies in the classroom lacked support, are outdated and the teacher's knowledge of CALL technologies altered according to each teacher's technology use. The lack of teacher support and

attitudes towards technology implementation brought the understanding that there is a need for a resource for teacher training and support in CALL technologies that support the 21st-century skills of ESL learners.

Covid-19 Interference

With the novel Covid-19 pandemic of 2020, many schools shifted from a face-to-face classroom to distance education (ED, 2020). This new reality brought many new challenges to the already existing challenges in the education world. The challenge is in both learning and teaching at a distance. It is important to acknowledge the challenges learners face when considering this adaptation. The main challenge right now is how institutions can shift to online education rather than assessing the quality of online teaching methods (Carey, 2020). In addition, Carey (2020) highlighted that technology challenges are disproportionate. According to research conducted by Xu and Jagers (2013, as cited in Carey, 2020) academically, marginal undergraduates struggle, specifically in English language and Social Sciences due to negative peer behaviors in online settings. Many students of low-income and students of color are more likely to drop out and the design of the courses concerning them is important (Carey, 2020). Dhawan (2020) indicated that online teaching is not an option but a necessity and resistance to this change will not provide any benefits. The adapting capabilities of education units are important during this transition. Liguori and Winkler (2020, as cited in Dhawan, 2020) recommended that innovative solutions offered by institutions can be beneficial. Basiliaia et al., (2020, as cited in Dhawan, 2020) suggested Google Classroom, Google Hangouts, Google Forms, Google Jam Board and Drawings, etc. Some of the problems included in online learning

are: attention span, lack of interaction and interest in the content, and lack of learning and practice (Dhawan, 2020). Meyer and Wilson (2011, as cited in Dhawan, 2020) commented that disasters will continue to happen and through the help of technology, we are more likely to cope with them. It is important to be prepared for online teaching for future pandemics or unforeseen natural disasters. Teachers need support in their classroom practices throughout this adaptation. Policymakers and governments must provide the necessary support to teachers in order to adapt to this shift and meet the needs of the learners.

21st-Century Learning Practice: Design Thinking as a Framework for Online Collaboration

Psychologist and Nobel Prize laureate Herbert A. Simon was the pioneer of design thinking (Fredrickson, 2017). Simon's book *Sciences of the Artificial* introduced the idea of design where he discusses the notion of design as "Everyone designs who devises courses of action aimed at changing existing situations into preferred ones" (Simon, 1996, p.123). Simon's design thinking model indicates that problem-solving behavior can be learned through developing new solutions in the stages of design (Simon, 1996). Design Thinking concept was initially developed in the design, architecture, and art sectors and learning scientists also started to inquire what would design thinking mean and look like in education (Goldman & Kabayadondo, 2017).

In the educational context, the design thinking approach has been defined in various sources. According to Goldman and Kabayadondo (2017), Design Thinking is the method and process of problem-solving which allows people to generate new solutions to problems. Davis

and Littlejohn (2017) suggested that in K-12 schools design-based approach promotes 21st-century and problem-solving skills, especially in an environment of constant change. It is a powerful tool to equip learners with interpersonal skills, incorporating the methodology of learning-by-doing (Goldman & Kabayadondo, 2017). John Dewey coined the theory of learning-by-doing to promote a pragmatist and progressive movement into traditional learning where the students are at the center of learning. Dewey argued what students were learning should be relevant to them and schools should promote practical life skills (PBS Online, n.d.).

According to Bamberger and Schön (1983, as cited in Goldman & Kabayadondo, 2017), designed things can “hold” meanings due to “reflective conversation with materials”. The combination of design and learning was essential in the education aspect of the Design Framework. In his article, Buchanan (1992, as cited in Goldman & Kabayadondo) combined the connection of design thinking, the 1960s design thinking approach coined *wicked problems*, and Dewey’s learning-by-doing theory. This combination brought design thinking into the educational context.

The Design Thinking for Educators (DTE) framework was created by the design firm IDEO. According to IDEO, design thinking is a human-centered design and promotes collaboration (IDEO, n.d.). IDEO’s website provides a toolkit for educators in K-12 schools that help them implement design thinking. A human-centered design allows one to put empathy in the core and come up with creative solutions. “Design thinking is a structured framework for identifying challenges from the learners, gathering information and generating potential solutions, refining ideas and testing the solutions” (Rudresh & Varghese, 2019, p. 130). Rudresh and Varghese (2019) suggest using Design Thinking as a framework in ESL classrooms and

indicate possible language improvement opportunities in a more collaborative and creative way. Design thinking consists of five stages: empathize, define, ideate, prototype, and test (Koberling, n.d.).

Design thinking has been implemented in K-12 schools to solve challenges. One example is from Michael Schurr, who is a second-grade teacher in New York and he wanted to better address the needs and desires of his students (Design Thinking for Educators, n.d.). He put his students in the center in getting their feedback and in the decision-making process and through re-arranging the learning environment, he promoted a more engaging classroom where his students now have the best possible learning space (Design Thinking for Educators, n.d.). Design Thinking Hawaii was another example where Castle High School in Hawaii used as a tool to improve the effectiveness of school and the academic skills of students (Design Thinking for Educators, n.d.). The Design Thinking cycle has been studied in the following studies in the ESL context and has been proven to support ESL learning. The study conducted by Begeg-Dov (2017) to improve the language course design and support adult language learners using design thinking provided insights into how students learn, their needs, and aspirations. The results were useful in helping find new ways to implement in online language courses (Begeg-Dov, 2017). Even though Design Thinking's approach may bring similar approaches to mind such as Project-based Learning (PBL) or Understanding by Design (UbD), the main difference is students are more autonomous in their own learning process. A PBL has essential questions that guide the students into the pre-defined activities and end goal, whereas in Design Thinking students create the essential questions to a provided thought-provoking content by the teacher (McIntosh, 2010). In addition, McIntosh (2010) discussed that unlike UbD "with the end in

mind,” Design Thinking encourages learners to ask questions within the stages: where do we choose to go, what do we choose to ask. However,

*“In schools, there is still an overriding belief that children need to learn first before they can undertake anything like this kind of research. **Wrong.** Engineers and children alike learn from posing a question and learning as a result of answering it. All they need is a great question that matters to them, and the best way to do that is have them learn how to create those superb questions”* (McIntosh, 2010, para. 26).

The K12 Lab program at Stanford University’s d.school is also one of the proponents of bringing design thinking into K-12 schools. K12 Lab’s website provides resources, workshops, and events for K-12 educators to promote deeper learning practices in their classrooms (K12 Lab).

Online Whiteboard Tools for Collaboration

Online whiteboard tools have gained popularity in conducting online collaboration. There are many various tools that fit the needs of collaborative learning practices such as Adobe Xd-Whiteboard, awwapp, MURAL, Miro, etc. For the purpose of this project, Miro will be used. “Miro is a collaborative online whiteboard platform designed for remote and distributed teams” (Miro). Miro can be used both in real-time and asynchronously. It helps in the stages of brainstorming, and ideation, as well as mapping and designing. One benefit it has compared to other online whiteboard tools is that it has an integrated video call. Even though it is not an alternative option for face to face collaboration, real-time collaboration with a video call option can mimic an in-person collaborative work option among students. Teachers can benefit from Miro by creating online collaborative groups among learners and give ongoing verbal and/or

written feedback on student work by either real-time video or by adding comments through the use of post notes. Apart from collaborative work, teachers can use Miro as a platform to upload pictures, documents, multimedia to promote thought-provoking questions. There are many creative ways teachers can benefit from using online whiteboard tools to make learning more interactive depending on what the learning purpose is. Especially during unprecedented times such as natural disasters, political climate changes, and global pandemics where schools aren't able to operate face to face teaching, online tools can help in making the distance gap less apart by making learning more engaging and creative.

Design Thinking framework incorporates collaborative learning and problem-solving skills into its practice which also serves in the promotion of 21st-century learning skills. Moreover, Design Thinking puts students in the center of the learning and learners make decisions about their own learning which also creates self-directed learners. Being in collaboration and cooperative work to solve a problem promotes dialogue and communicative language approach where it leads to the creation of an authentic environment for the extensive use of language in a meaningful way. Language learners can benefit through the online collaboration within the design framework and improve their listening and speaking skills. Through using an online collaboration whiteboard tool such as Miro, English language learners can also improve their reading and writing skills. In addition, seeing their own writing can bring awareness to the correct use of language and possible spelling mistakes.

Summary

By providing three themes and relevant ESL studies, this literature review focused on 21st-century learning theories, the need for change, lack of teacher support, and how the Design Thinking Framework can aid in promoting an engaging collaboration among ESL students.

The first section of the literature identified 21st-century learning shifts and theories in ESL. It first explored the paradigm shift and the need for a change. Kuhn's (1970) pioneering work on paradigm shift provided help in thinking about changes in education. Jacob and Farrell (2001) enumerated eight key components relevant to this shift in the second language acquisition field. Among those eight key components, learner autonomy showed a close connection to Vygotsky's concept of self-regulation (Jacobs & Farrell, 2001). The teaching and assessment methods were observed within this paradigm shift and it was discussed that due to the piece-meal approach, educators cannot move beyond in their method (Jacobs & Farrell, 2001). In addition, studies of Eaton (2010) contributed to the fact that there needs to be a change in the way students learn. In an effort to promote 21st-century learning, P21 designed a framework to prepare students for the future work world. The theories provided in this chapter were. Social Development Theory/Zone of Proximal Development, Collaborative Learning, and Computer-Mediated Communication. All of these theories provided relevant information in promoting both language development and 21st-century skills. Goodsell et al., (1992), Hämäläinen and Vähäsantanen (2011), Kirsch (2016), WIDA Consortium (2013), Gillies and Boyle (2010), and Le et al., (2017) emphasized the challenges in the effectiveness of the implementation of collaborative learning and a need for teacher training. Studies of Simpson (2002), Savignon and Roithmeier (2004), Ozdener and Satar (2008), Belz and Thorne (2006),

Volle (2005), and Nguyen (2008) underscored the importance of computer-mediated communication in ESL classrooms.

The second theme explored technology as a tool to develop 21st-century skills in ESL classrooms. Eaton's (2010) study revealed the impact of technology in ESL classrooms. Similarly, Black (2009) observed that new technologies can help language development and 21st-century skills. Studies of Yang (2013), Lan et al., (2007), and Muchtar (2017) elucidated that MALL activities promote second language learning and learner autonomy. Moreover, Eaton (2010), Black (2009), Leong et. al (2018), and Terrazas-Arellanes et al. (2017) provided the reasoning that emerging educational technologies expanded ways of teaching and language learning in the 21st-century. The second theme also expanded on teacher preparedness and the need for teacher support in technology integration. Kessler (2007) discussed that there is a lack of teacher training and a persisting challenge for technology use (2018). The findings of Egbert, Paulus, and Nakamichi's (2002) study revealed that due to time constraints, lack of resources and administrative restrictions teachers do not use CALL activities. In addition, with the current global pandemic Covid-19 and the quick shift to online education, Dhawan (2020) and Carey (2020) highlighted the importance of preparation for online teaching in unforeseen circumstances and the need for teacher support.

The third theme identified 21st-century learning practice: Design Thinking as a framework for online collaboration. This final theme acknowledged the Design Thinking model in the educational context and its uses to promote collaboration. Design thinking was first introduced in Simon's book *Sciences of the Artificial* (1996). Learner scientists' inquiry on design thinking carried the design practice into the education field (Goldman & Kabayadondo,

2017). Design Thinking framework incorporates the methodology of learning-by-doing (Goldman & Kabayadondo, 2017). John Dewey was the founding father of learning-by-doing theory which became inspirational in the methodological approaches of design thinking framework in education. In the educational context, IDEO first created the Design Thinking for Educators (DTE) framework. Design thinking is a human-centered design and challenges the learners to create potential solutions to problems and testing those solutions (Rudresh & Varghese, 2019). Design thinking is implemented in K-12 schools to solve challenges using problem-solving and empathy skills. The study conducted by Begeed-Dov (2017) revealed the effective use of Design Thinking as a framework to improve online language course design. Another article by Rudresh and Varghese (2019) suggests the possible benefits of Design Thinking and it can help English language learners to improve their speaking and collaborative skills. There are online resources that promote design thinking framework. One of them is Stanford University's K12 Lab program. K12 Lab supports educators to promote deeper learning practices (K12 Lab). The design firm IDEO's website is also informative in teaching design thinking framework and has online resources provided for K-12 educators. Lastly in the theme, Miro which is an online collaboration tool is suggested to conduct effective communicative online collaboration.

Learning theories based on Social Constructivism, Communicative Language Teaching, Computer-Mediated Communication provided the main backbone of this project in providing the necessary background knowledge in creating an understanding of promoting online collaboration in ESL classrooms. Design Thinking is the framework that will be used for online collaboration

and Miro—an online collaboration whiteboard tool— will be used to promote an engaging online collaborative ESL teaching.

This chapter provided evidence and support for the claim that there needs to be a resource for teachers and policymakers to acknowledge the 21st-century educational model, and how ESL teachers may adapt their practices geared towards this shift when promoting online collaboration. With the resource, it is aimed to achieve that teachers and policymakers will understand the need to change and gain new perspectives in the application of effective online collaboration. The online addition to this project was prepared considering the current global pandemic Covid-19 and the effect it has brought into schools and face-to-face learning. The project was prepared specifically for ESL teachers in the classroom who have first-hand experience in trying to implement the best possible practices in their teaching and to help prepare them better serve the needs of the learners in the 21st-century.

CHAPTER III THE PROJECT AND ITS DEVELOPMENT

Description of the Project

This project is a website for primary English as a second language (ESL) teachers. It is designed to help promote 21st-century skills in and outside of the classroom. It is intended to help ESL teachers understand 21st-century learning and design for today's ESL students. Like most teachers, ESL teachers are shifting their classroom practices towards this new model and there are challenges due to lack of teacher training.

The Design 21st website is built to equip the ESL teachers with the most relevant teaching model through expanding on topics such as 21st-century skills, collaboration, technology and collaboration, and design thinking framework. ESL development is explained in combination with 21st-century skills, collaboration, and technology. Design Thinking framework is presented to foster meaningful collaboration in classrooms. Additional resources are included to support both ICT and ESL skills.

Organization

The website Design21st is organized from broad to narrow to funnel the bigger understanding down into practice so that the information is easily understood.

The user is first introduced to a broader understanding of the shift in education and 21st-century skills. The broader understanding is then narrowed down to Collaboration—which is one of the 21st-century skills, followed by how technology could be used to promote online collaboration. Finally, the Design Thinking framework is introduced to suggest a meaningful collaboration model. Resources and About page is provided for additional links and contact.

Content of Sections

Home (Promoting 21st-century learning & design for today's ESL students)

The homepage begins by introducing how students of the 21st century engage and learn differently and the need for policymakers and teachers to adapt to this change. The page underlines the importance of collaboration, ICT skills both in 21st-century learning and ESL. The purpose of the website is explained; which is to help ESL teachers understand and promote a 21st-century model in their practices as well as supporting the ESL teachers with the relevant tools. Additionally, it is suggested that online teaching can promote collaboration and language development. Furthermore, it is noted that an online teaching model can be used as an alternative way of communication during times of pandemics, natural disasters, or political crises.

Why Collaboration

This section explains the 21st-century understanding and the importance of collaboration, especially in the second language learning domain. Advantages of collaboration are listed and how collaboration develops language functions is elaborated. The page encompasses the understanding of collaborative learning design and practice and how collaboration promotes social skills. Additionally, the teacher's role in the collaboration is explained and links relevant to facilitating inquiry, inquiry-based teaching, organizing groups, and assessing group work are provided. There are downloadable group and self-assessment tools in .pdf and .doc documents.

Technology and Collaboration

In this section of the website, the use of technology through collaboration tools is explained. Online collaboration and its effects on student engagement and language development

are provided. This page presents examples of online collaborative tools that could be useful in ESL classrooms. The importance of supporting new literacy and ICT skills are demonstrated with resources for reading, writing, listening, research, and interactive skills.

Design Thinking Framework

Design Thinking Framework is introduced as a resource to facilitate a collaborative approach. This page provides information on the main understanding of design thinking. The advantages of the Design Thinking education framework are explained and the five stages of design thinking are presented. This page provides toolkits from IDEO, d-school, school retool, and the teachers guild for educators who want to implement collaboration through Design Thinking. Three downloadable design thinking framework challenges from Stanford dschool are provided for teachers in .pdf formats.

Resources

On this page, additional resources on Design Thinking framework and online whiteboard collaboration tools are provided. ESL teachers can utilize these resources to understand the design thinking framework which are useful for collaboration. Six resources are shared under the Design Thinking framework. Some of the resources provide free downloadable toolkits for teachers. Besides, six online whiteboard collaboration tools are listed. Most of those tools are free and offer different ways of collaboration. Teachers can use these tools during an ongoing online class session. Some of those tools provide video features where the participants can work together synchronously. Depending on the project or the need, ESL teachers can choose the right online collaborative whiteboard tool. The list of resources can also be found in the making of the website.

About

This page is about the content creator of the website. More information about the content creator, contact address, and subscription can be found on this page.

Development of the Project

As a former ESL teacher at K-12 schools, I have always been interested in improving the current teaching conditions for my students. The current trends in teaching in the 21st-century show that today's students are engaging and learning differently. I am interested in how we can teach best to improve the learning outcomes. In my previous years of teaching, I have implemented a 21st-century teaching approach and created content according to the interest of my students, and have observed that my students were more involved in the learning process. In addition to the content, creating collaborative groups in literature circles or projects not only helped them develop their content knowledge, but also improved their communicative skills.

Collaborative projects help students to learn from each other and students are given more opportunities to use their second language in a communicative setting. For that reason, ESL teachers should create more of those situations where students can practice their second language. Collaborative activities also allow teachers to observe students' language production in meaningful contexts. In addition to language production, it is important that all teachers support 21st-century skills development. My intention in developing this project was to promote collaboration and a 21st-century learning environment in ESL classes. To create educational equity and quality, teachers need to focus on what the future work world needs are. A body of

research showed that most teachers lacked the training to integrate collaborative activities and technology into ESL classrooms and need support from the policymakers. Teachers and policymakers can develop a curriculum where students are engaged in collaborative projects that are meaningful and challenging. Planning for effective collaborative activities requires prior planning and the process can be difficult for teachers who do not receive training. Moreover, many teachers fear that they are not able to control the learning process in collaborative tasks. In developing this project, I wanted to ease this process for ESL teachers by providing a structured framework that could be used. Through collaborative frameworks, teachers can plan for learning steps and guide the students within the learning process. Throughout the years I have taught, I worked on different frameworks that I found were effective to improve critical thinking and collaboration skills. One of them was project-based learning. In project-based learning students work towards a project that solves a problem around the central idea or essential question that is given to the student from the beginning. Working at PYP/IB schools, I know that such a design or project is an interdisciplinary approach and can be helpful to embed the main idea. However, this pre-defined path makes it more about the central idea or the project itself than the learning and I wanted to focus more on the learning since it is process-oriented and allows more student choice.

During my research for online collaboration tools, I attended the Hasso Plattner Institute of Design's webinars at Stanford. Here I discovered MURAL; a whiteboard collaboration tool. This is where I was introduced to the Design Thinking framework. I was inspired to think about this framework because there was something fresh and relevant to what I was looking for. The design framework cycle was more about the learning process and allowed students to create their

questions. It gave the students the chance to revisit their design steps and redesign the project. This led me to inquire about the Design Thinking Framework and I was affected by how empathy was at the center of the design. I believe that empathy is one of the values we need to focus more on as part of 21st-century learning for a sustainable and equitable world. Also, through improving empathy skills, we can improve active listening which is helpful to improve ESL. We can read for perspective and develop points of view. In the Design Thinking framework, the combination of collaborative work and the focus on the process rather than the product could help ESL learners improve their language reception and production. In project-based learning, I have observed that many students were worried about completing their project and not much attention was given to the process. Sometimes not all students are interested in finding a solution to a narrowed down central idea or a question pre-defined by the teachers. To engage students more in the learning process, we as teachers need to allow the flexibility for students to generate questions that are meaningful to them. This makes the project more purposeful for the students and puts the students' ideas at the center. In the educational paradigm shift, this is a great step where the teachers can design for learning and move away from the instructor role. I believe that the Design Thinking framework promotes the kind of environment ESL students need; both to collaborate and to improve language learning.

At the previous schools I have worked at, I have observed the lack of training teachers received on improving their ICT skills. Part of the 21st-century design and learning includes technology tools that allow collaboration and language development. ICT skills are integral to 21st-century learning and a body of research shows that many teachers lack ICT skills and do not

receive enough support from the policymakers. Design21st website briefly describes what those skills are and how collaboration can promote those skills.

Due to Covid-19, most teaching has been carried to distance learning as of March 2020. With this current shift, most schools and teachers have started to redesign how to effectively deliver content. During this time frame, I had a chance to talk with my former colleagues from various schools and students around the world. I found out most of the teaching did not allow students to collaborate and most classes were teacher-centered. For this reason, I also wanted to focus on the online collaborative tools as a way to support teachers to deliver a more student-centered classroom in times of uncertainty.

Lack of inadequate resources and understanding the need for change results in learning models that aren't as engaging for today's students. This can result in lower academic achievement or high-drop rates at high schools or colleges later on. With the overwhelming resources available online, teachers can be overwhelmed or may not know where to start. I created this website to help teachers grasp the main understanding of 21st-century design and practice and in particular help ESL teachers who want to adapt their current practices accordingly. Through this website, I hope to contribute to the understanding of the need to change in education and support the teachers of the 21st-century who are active agents in making this change.

The Project

<http://www.design21st.com>

Examples of the website content, as well as links to individual pages, can be found in the appendix.

CHAPTER IV CONCLUSIONS, AND RECOMMENDATIONS

Conclusion

Students of the 21st-century need effective and engaging learning models that can prepare them for the future world. Teachers and policymakers need to understand the paradigm shift in education and adapt their teaching to meet the needs of today's students. This field project created the website Design21st as a resource for ESL teachers and policymakers to give a brief understanding of 21st-century learning and ways to promote effective online collaboration in and outside of the classroom.

21st-century learning is a combination of content knowledge specific skills, expertise, and literacies (California Department of Education, 2019). Collaboration is one of the 21st-century skills that are also essential in second language development. It is important that ESL teachers of the 21st-century integrate collaborative learning practices both to promote language development and to create a student-centered approach. In ESL classrooms, a collaborative approach can take place through meaningful projects where students work collaboratively to solve problems using their second language. Studies of Goodsell et al., (1992), Hämäläinen and Vähäsantanen (2011), Kirsch (2016), WIDA Consortium (2013), Gillies and Boyle (2010), and Le et al., (2017) highlighted the importance of effective collaborative learning and the lack of teacher training.

Emerging technologies can support language development and learning autonomy (Black, 2009, Eaton, 2010; Lan et al., 2007; Muchtar 2017, Nguyen 2008; Yang, 2013). Studies of Nguyen (2008), Roithmeier (2004), Ozdener and Satar (2008), Belz and Thorne (2006), and

Volle (2005) revealed a positive correlation between using computer-mediated communication and ESL development. Technology and ICT activities are shown to support the development of 21st-century skills and language proficiency. However, a body of research shows the lack of support teachers receive when using technology tools in classrooms due to persisting challenges for technology use (Kessler, 2018), lack of resources, time constraints, and administrative restrictions (Egbert, Paulus & Nakamichi's, 2002). Design21st website equips ESL teachers and policymakers with the understanding of 21st-century skills, technology, and online collaboration. These user-friendly tools are selected to engage and motivate the ESL learners. Design21st website also provides tools for creating online collaboration and how various online resources can improve ICT skills and ESL.

For language development, collaborative activities should be enhanced in ESL classrooms. Through group work, students can develop their listening and speaking skills. Besides, meaningful projects promote high-order thinking and self-management skills. Finding frameworks that support collaborative learning practices can be beneficial to better engage the learners and make collaboration more effective. Design Thinking framework is introduced in this field project to support effective collaboration. Design Thinking promotes problem-solving and dialogic thinking and promotes 21st-century skills. Design21st website provides the knowledge of Design Thinking framework and tools so that ESL teachers can create an engaging classroom, improve ESL students' collaborative skills, and language reception and production.

With the novel Covid-19 and the quick shift to distance education, teachers did not have enough time to prepare for online teaching (Dhawan, 2020; Carey, 2020). Through the use of technology, ESL teachers can create effective collaborative environments in and outside of the

classroom for language learners. Design21st website has various resources on online whiteboard collaboration tools that ESL teachers can benefit from.

The Zone of Proximal Development theory, collaborative learning, and computer-mediated communication theories were used as a theoretical framework to support the overall understanding of ESL learning, the development of 21st-century skills, and the use of technology. The interactive learning aspect of ZPD is found to promote language development and critical-thinking skills (Lee, 2015). A collaborative, dialogic, and open to sharing classroom environment is essential in building knowledge among learners (Wells, 1999). Design Thinking Framework and online collaboration supports ZPD, collaborative learning, and CMC theories and have been instrumental in the creation of the Design21st website.

In conclusion, the Design21st website provides ESL teachers a brief understanding of the 21st-century skills, the importance of collaboration and ICT skills in ESL, and how Design Thinking could be used as a framework to promote collaboration and ESL learning.

Recommendations

The Design21st website was developed to support the 21st-century education knowledge and practice of ESL teachers and policymakers. It is hoped that this website promotes the understanding of the shift in education from a product-oriented to a process-oriented one. Through the tools provided on the website, ESL teachers can improve the students' ESL learning and the development of 21st-century skills. Also, the resources on this website aim to develop more authentic and meaningful activities where the students are at the center to create and

engage. It is encouraged that ESL teachers and policymakers move away from a traditional ESL classroom model and use a lens that focuses on student engagement.

Before working on the Design Thinking framework and online collaboration, teachers must conduct effective, in-class collaborative activities. In effective collaborations, the teacher guides the students and can take part in the collaboration. Students know what the task is and are aware of their self-management skills. In ESL classrooms, the teacher should provide language functions that are required in group work. Effective collaboration can also require preparation on the teachers' side. During the online collaboration, teachers can use checklists to demonstrate the learning goals and what is expected during online collaboration. The groups should be pre-designated so the time allocated is only used for actual collaborative work. Design21st website provides organizing group work and assessing group work rubrics. ESL teachers can modify them according to the needs of the learning goal and their classroom. The online collaboration tools on this website vary according to the needs of the classroom. Initially, they were selected for primary level ESL students, so the focus was to find user-friendly online whiteboards. Later on, more tools were also added so that many other levels can benefit from these resources.

Incorporating a Design Thinking framework can be challenging initially and teachers need classroom projects to embed it. However, ESL teachers can initiate this process by working on the stages of the Design Thinking framework. It is important to acknowledge that students will also learn throughout the process and what is new to teachers is also new to the learners. Reflecting on the process and getting student feedback can be beneficial in the implementation of this framework. To begin with this framework, the Design21st website provides three design

challenges to be used in the classrooms. Teachers would need to modify the provided resources according to the students' English learning level.

The Design21st website is created to be dynamic, so it is recommended that teachers subscribe to the mailing list or visit the website to see the latest resources on 21st-century learning and design. Lastly, ESL teachers and policymakers contact the creator of this website for further questions regarding 21st-century research and design.

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APPENDIX

Design21st

Promoting 21st-century learning & design for today's ESL students

Students of the 21st-century engage and learn differently than ever before. Policymakers and teachers are now challenged to makeshift into this new model and adapt their approaches and methodologies to better prepare the students for this change.

Information and Communication Technology (ICT) and collaboration skills are important both in 21st-century learning and ESL. A body of research shows that ESL learners can benefit from collaboration and technology to improve their oral and written production.

Due to the novel coronavirus, most classrooms shifted to online teaching and teachers need support to adapt their teaching in an online platform. Through online collaboration, ESL teachers can promote both their students' development of 21st-century skills and second language learning.

This website was created to support the knowledge and understanding of the ESL teachers who want to integrate a 21st-century approach to their teaching practices. This website will also be useful for ESL teachers as a resource to adapt their online teaching and how to improve their current one.

A 21st-century framework which is design thinking is also introduced on this website with tools to help ESL teachers when promoting a collaborative learning model.

Why Collaboration?

Home Why Collaboration? Technology and Collaboration Design Thinking Framework More

Why Collaboration?



Collaboration is one of the 21st-century skills that is necessary in the future work world. In our classrooms, one way to promote 21st-century skills is through collaboration. Collaborative activities are essential in language learning development. Students produce new information through collaboration when they work in groups. Especially in second language classrooms, students learn the language more efficiently when engaging with each other. Collaboration helps students to engage in dialogues through working together. Studies show that effectively facilitating a group is a 21st-century skill and necessary for the future work world.

Advantages of Collaboration

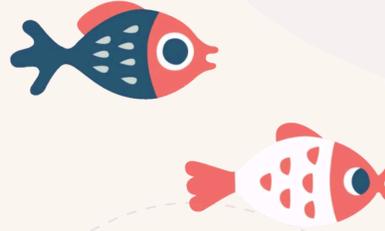
- Students learn from each other
- Promotes high-order thinking skills
- Improves social skills
- Develops critical thinking skills
- Students become self-directed learners
- Helps developing meta-skills
- Working according to interest/skills improves motivation
- Improves language comprehension and production

COLLABORATION AND ESL LEARNING

Collaboration helps ESL students to practice the target language in a meaningful and authentic context at their own level of proficiency while providing them access to comprehensible input and an opportunity for output. Through sharing ideas students can improve their comprehension and production skills through the communicative use of language. Collaborative learning activities provide the perfect environment for students to learn from each other by showing an understanding of a topic and the need to exchange ideas in a real-time conversation. It also improves ESL students' vocabulary and grammar. Collaborative learning gives students the chance to develop their language functions such as:



- Compare and contrast
- Persuasion
- Asking questions
- Expressing likes and dislikes
- Cause and effect
- Summarizing
- Sequencing
- Predicting
- Agreeing/disagreeing



* It is important for ESL teachers to practice vocabulary and the grammar structure relevant to function before collaborative work.

Understanding Collaborative Learning Design and Practice

Collaborative learning which is a student-centered approach refers to environments where students learn together. Each individual takes part in the learning process to create meaning together. The main objective is to facilitate cooperation in meaningful and interactive activities.

Students work together through the processes of inquiry, making meaning, coming up with solutions, and sometimes a product. Teachers can group students to work on a problem together, create drafts of work, coming up with solutions, literature circles, discussing and sharing points of view. While getting engaged in these types of activities, it's no secret that students work on their social skills. Here are some of the social skills students can develop through collaborative learning which will be essential to overcome future challenges in their academic or work world.

WHAT SOCIAL SKILLS DOES IT PROMOTE?

Accepting different ideas
 Listening actively
 Showing empathy
 Following directions
 Communicating clearly
 Agreeing and disagreeing politely
 Resolving conflicts
 Taking turns
 Staying on task
 Time-management skills



It might be beneficial to practice these skills by embedding them into handouts/worksheets to create awareness. Students can reflect on their social skills within a collaborative activity.

WHAT'S TEACHER'S ROLE IN COLLABORATION?

In a collaborative environment, the teacher's role is a facilitator. The teacher as a facilitator should support the learning environment and the learning journey of the student so that the learner can draw his/her own conclusions. Here are some of the roles of the teacher in collaborative learning.



Introducing a theme or present a statement that is interesting, thought-provoking for students, where it can lead to an inquiry.

Promoting curiosity and engage students in thinking critically/asking questions.

[Learn more about facilitating inquiry >](#)

[Learn more about inquiry-based teaching >](#)

Grouping the students according to learner style, interest, knowledge of a topic, skills in pairs, or groups.

[Learn more about organizing groups >](#)

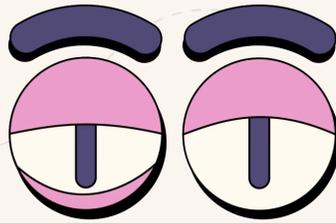
Monitoring student learning and assess their progress through formative assessments.

[Learn more about assessing group work >](#)

Download an example group and self-assessment tool



Taking part in facilitating group collaboration within the group and provide support when necessary.



Need a framework on how to promote meaningful collaboration?

DESIGN THINKING ↗

Need resources on how to promote collaboration through technology?

TECHNOLOGY COLLAB ↗

21st-century skills

What are the 21st-century skills?

The changing nature of the classrooms in the 21st-century brings the need for how to effectively prepare students for tomorrow's classrooms and how to transition our current one. By incorporating 21st-century skills and methods, teachers can create engaging and inspiring lessons for students. 21st-century learning brings along the need to equip the students with future work skills. According to P21 Partnership for 21st Century Skills (P21), a national organization as a catalyst in the 21st-century education movement lists learning and innovation skills as The Four C's:

Critical Thinking
Communication
Collaboration
Creativity

Information, Media, and
Technology Skills

Life and Career Skills

Source: Remakelearning.org

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Technology and Collaboration

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TECHNOLOGY AS A TOOL TO IMPROVE SECOND LANGUAGE LEARNING



Studies reveal that the integration of computer technology can be used to improve language development and collaboration. It can also help solve the problems in collaboration when conducting traditional language activities.

Teachers can benefit from using online collaboration tools to improve students' comprehension and production skills by providing them tools or platforms for students where they can improve their written and spoken production.

With online collaborative tools, students can improve their writing skills receive more language input from their peers which can model for their own language development. It can also help with improving the attention span of the students and help them work engaged and motivated.

1. Increases motivation which is key in language learning. Computer-generated materials are more engaging than textbooks.

2. Mobility offers to learn the language from anywhere.

3. Promotes online collaboration which develops communication skills such as Speaking, Listening and functions within the communicative language.



4. Improves written production. This can create awareness of the right use and choice of words. Students receive more written input through their friends' responses or the presented text. Some tools provide correction of words. Teachers can make real-time error corrections so errors don't fossilize.

5. Students learn in a context, making the language learning more effective.

6. Provides a richer environment where students engage in various skills such as listening, reading, and writing activities. For example, students can read more complex text types and different grammatical features.



HOW CAN TECHNOLOGY PROMOTE ONLINE COLLABORATION IN ESL CLASSROOMS?

Popular media and new technologies can help ELLs develop both print literacy and 21st-century skills.

Teachers can use various technology tools to create opportunities for the use of communicative language.

Here are some examples of online collaborative tools that can be found online that can benefit ESL learners' language development:



-Using GoogleDocs to share documents and work on the documents simultaneously. ESL students get more input through working together and seeing others' work.

- [Spiral](#) for project collaboration and formative assessment
- [Storium Edu](#) for collaborative writing game
- [Classcraft](#) promoting collaboration and motivation
- Creating [Webquests](#)
- [Edmodo](#) for online classroom collaboration
- [mirq](#) for online white-board collaboration

HOW TO SUPPORT NEW LITERACY AND ICT SKILLS?

Using technology as part of 21st-century learning can help students develop new literacy and ICT skills. ESL teachers can promote the reading of fiction texts, online discussion boards, social networking sites, fan communities, and video gaming in online spaces to improve new literacy skills. Student portfolios, student-made blogs, Wikis, and podcasts are shown to support ICT skills.



Infographics are the 21st century way of reading and interpreting data. It helps students to critically think about data, an idea, or information. Learners can collaboratively make meaning through reading an infographic and extract data. Through creating their own infographic, learners develop their high-order skills and research skills through finding data and conveying it to an audience.

Here are some resources to support ESL learner's language, new Literacy and ICT skills.

reading & writing



Students can read stories and write their own.



Students can collaborate on projects or write by creating their own online board.



Students can create their personal online journals.



Students can create infographics.

reading



Students can read news from Washington Post for kids.



Students can read Science News.



BBC News for kids.



Students can read non-fiction text.



Students can read magazines according to topic.



Students can read drama scripts to act out.

listening & reading



Students can listen to audio stories.



Students can read stories with interactive activities.



Storyline Online®, streams videos featuring celebrated actors reading children's books alongside creatively produced illustrations.

reading/research



Resource for reference materials, fun facts, and features, and homework help for kids.



Latest record-breaking action from around the world - just for kids.



Safe search for kids with interactives



Safe search for kids

interactive



Students can read with fun phonics activities.



A free public service to teach children K-3 to read.



Resource on e-books to learning aids to help with homework and projects



Interactive activities and videos for kids.



A community of fans across multiple channels with digital media.



Students read stories and watch videos and play games



Interactive and DIY activities from NASA Kids.



Commercial, free public radio for kids.



Kids' hits

more resources

Design Thinking Framework

promoting 21st-century learning & design for today's ESL students

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DESIGN THINKING FRAMEWORK

"Design is the transformation of existing conditions into preferred ones."
 —Herbert A. Simon in the "Sciences of the Artificial" (MIT Press, 1969).

"Design thinking is a human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success."
 —TIM BROWN, EXECUTIVE CHAIR OF IDEO



A design thinking education curriculum provides students and teachers the opportunity to immerse in a real-world problem solving. At the core of the design and problem solving there is a need to solve a problem through the needs of people or situation.

Students work collaboratively to pose questions when defining a problem such as:



"How might we design a classroom habitat for plants and animals to co-exist?" Or, "How might we create machines based on historical models?" Or even, "How might we create a playground space for disabled students?"

(Questions are taken from EdSurge- Design Thinking Is a Challenge to Teach—and That's A Good Thing)

This allows students to brainstorm possible solutions, plan, and test their products. The focus isn't about the product, but also the steps that are involved in the process. This gives the students a chance to rethink, revisit, revise, and recreate possible solutions before they move forward.

What are the steps of the design thinking framework?

Hasso Plattner Institute of Design at Stanford (d.school) pioneered the approach in K-12 education. The thinking model that was proposed by the d.school proposes five stages in the design thinking framework: Empathise, Define, Ideate, Prototype, and Test.

1. Empathise: In the first stage, the purpose is to gain an understanding of the problem from an empathic point of view. This means, getting to know whose problem will be solved and more background information about the environment. This part involves deeper thinking and using a variety of methods to collect relevant data to solve the problem. Empathy is important and is the center of the design approach.

2. Define: This is where the problem is defined through the data that was gathered. Defining involves the focus of core problems and creating a problem statement in a human-centered manner. An example would be; instead of defining it as your own need such as,

"We need to increase our food-product market share among young teenage girls by 5%," a much better way to define the problem would be, "Teenage girls need to eat nutritious food in order to thrive, be healthy and grow."

Source: Interaction Design Foundation

3. Ideating: In the ideating stage, students design solutions to the problems they have defined in stage two. This is where many ideas are brainstormed to come up with possible solutions and it is important to be as open-minded and diverse solutions coming from different students. Exchanging ideas through collaboration, this stage helps students to find ways of solving problems. Questions such as "How might we ..." are really helpful. For example: "How might we design the most suitable bed for the Goldilocks family?"

Here is an ideation technique:



"It's not about coming up with the right idea, it's about generating the broadest range of possibilities."

- d.school, An Introduction to Design Thinking PROCESS GUIDE

4. Prototype: This process consists of designing sample versions of the product that was created in the ideating stage. It includes features of the product

and is generally tested to identify the best possible solution through an experimental approach. The possible solutions can be tried out and tested as much as possible.

5. Test: In the test stage, the completed design/idea is tested. This is an important part in terms of observing how the completed design had an effect or a relationship with the user. The conclusions are drawn from this and it is an informative phase to think of how people behave, think and feel etc. The design can be revisited and redesigned again and find relevant information in the testing stage that could be helpful in another stage. The design thinking model is flexible and any part of the phases can be revisited.

Source: Interactiondesign.org

The Teachers Guild x School Retool provides equitable resources for design process. Click on the image to go to the website.



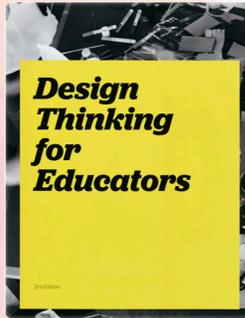
+ the
TEACHERS
GUILD

= CO-DESIGNING
SCHOOLS
TOOLKIT



Stanford University's Hasso Plattner Institute of Design, (d.school) pioneered the approach in K-12 education.

IDEO's workbook can be used as a resource to design meaningful solutions in and outside of the classroom specifically for collaborative projects. Click on the book below to download.



Stanford d.school provides three design-thinking framework challenges you can try in your class! Click on the image above to find out more, or you can download the pdf's here.



Foil Challenge



Re-design the gift giving experience



Re-design school lunch experience

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[Interaction Design Foundation](#)

[Deep Design Thinking](#)

[American English on Design Thinking](#)

[The Synapse on Design Thinking](#)



Follow #dtk12chat on Twitter to engage with design thinking educators!

Online whiteboard collaboration tools

[MURAL.CO](#)

[miro](#)

[Adobe XD](#)

[BeeCanvas](#)

[padlet](#)

[Lucidspark](#)

These websites were instrumental in the creation of this website

[Americanenglishstate.gov](#)
[Battleforkids.org](#)
[California Department of Education](#)
[Codesigningschools.com](#)
[Deepdesignthinking.com](#)
[Dschool.stanford.edu](#)
[Edsurge.com](#)
[Envision Experience](#)
[Gettingsmart.com](#)
[ideo.com](#)
[K12 Academics](#)
[Laura Candler's Teaching Resources](#)
[Medium.com](#)
[National Education Association](#)
[Paperity.org](#)
[Remakelearning.org](#)

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Originally an English as a second language teacher, I have pursued my master's degree in TESOL and Educational Technologies. My passion for teaching is learning about how students learn best. Consequently, it led me to find out more about learning theories and do research on best practices in teaching language to 21st-century learners.

I am particularly interested in how to support language learners and equip them with the skills that will prepare them for the future work world.

My research interests are first and second language acquisition, collaboration, inquiry-based approach, and design thinking framework.



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*Promoting 21st-Century Skills through
Online Collaboration*



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