

Incorporating Technology into CPBL to Enhance English Learning

Abderrazak Zaafour

Department of English Philology, Education Sciences,
International PhD School, University of Almeria, Spain
ORCID <https://orcid.org/0000-0002-6369-5271>

Abstract: PBL is a teaching model used widely all over the world. In this model, the real task is designed and the learning content is set under a complex and meaningful project situation. Through self-inquiry and cooperation, students solve the problem to learn the implicit knowledge, and then the abilities of problem-solving and self-directed learning are formed. Furthermore, blending technology into PBL can positively impact student learning outcomes. Web-Based-Learning (WBL), PBL and Cooperative Learning (CL) are currently considered among the most powerful educational options. These approaches can assist English language students to improve their creativity, critical thinking and collaboration. On the other hand, the term New Technology includes communication techniques for language teaching in which the personal computer plays a central role. There are, however, other technological tools that can be used in language learning besides computers. Each technological tool has specific applications and benefits for each of the five language skills (reading, writing, listening, speaking, and talking). However, to use these techniques successfully, the English language learning student should be familiar with using computers and the internet, as well as being capable of interacting with these techniques.

Keywords: Project-Based Learning, Podcasts, Web-Based Learning, Cooperative Learning, Technologies, Motivation, English as a Foreign Language (EFL)

1. Introduction

The effect of technology has become hugely significant in teaching and learning the language in addition to the instructor's role. In other words, the role of the instructor together with the role of technology can lead to advanced learning results (Yaman et al., 2016). Many techniques can be used to help both teachers and students, among which we find online English language learning websites, computer-assisted language learning programmes, presentation software, electronic dictionaries, chat and email messaging programmes, podcasts, and educational video clips. The use of these techniques and tools in the English language classroom is very useful for both teachers and learners.

Currently, numerous software application programmes are projects available such as vocabulary, grammar and pronunciation programmes, spelling check utilities, electronic workbooks, reading and writing programmes, and different learning packages to assist instructors in creating many tutorial activities to enhance their English language courses in a professional way (Kim & Kwon, 2012).

By English language skills we mean the development of the main parts or elements of the language which are reading, writing, listening, speaking, talking, and culture. Each language subject or area has different educational tools that are likely suited to it. The use of several technical tools has a significant effect on the learning process of each area of the language (Yaman et al., 2016).

Recent advancements in technology, especially in the last decades, have created new opportunities and possibilities to extend and enhance learning, teaching and assessment. Besides technological and computer science innovations, new models of where and how learning can take place mediated by smartphones, tablets, computers, and other smart devices allow using various types of innovative applications to enhance learning in general and the learning of English in specific, are now available (Kim & Kwon, 2012). Blending these new technological features in PBL and CL can certainly offer new potential to design inclusive, engaging pedagogy in a range of diverse learning contexts.

Therefore, the appropriate time is now to bring forward state-of-the-art technological learning opportunities and see them applied widely in the education of the English language. The use of technology in the teaching of the English language has assumed even greater importance considering the current global (COVID-19) pandemic and the need for access to education, schools, and training while people must maintain a physical distance. It is now imperative that we can innovate and explore the best approaches and strategies for learning with portable digital technology. Furthermore, the latest challenges we are facing force us to rethink, redesign and reimagine education, learning and teaching in ways that override automated outmoded approaches that previously prevailed and try to motivate students to learn and solve problems cooperatively taking advantage of all that the new technologies can offer.

Kim & Kwon (2012) put forward the implementation of PBL in the network environment, focusing on the analysis of the impact of network technology on the implementation of PBL,

but did not explicitly put forward the concept of technology and PBL integration. It had the shortcoming that the students often paid too much attention to practical operation and neglected the formation of curriculum knowledge (Chen, 2021). Mitchell & Rogers (2020) combined PBL with Micro-Lessons, applied it in Electronic Design Technology Course teaching, and promoted the implementation of PBL by using the flipped classroom where students can carry out collaborative work via the virtual classroom and view the contents at home, then in the face to face training “apply” the content. To avoid having problems while implementing this, teachers should be knowledgeable about the use of modern technologies, and approaches to teaching and learning. The virtual classroom should be set up with materials, activities and forums that allow distance learning to continue.

Usher & Barak (2018) applied the PBL approach in extracurricular activities, improving the participating students’ technology, interdisciplinary and interpersonal skills. The combination is a logical outcome of the development of educational technology and PBL. However, the existing research has not given a generalisability of the combination of the two learning models. Therefore, this chapter is committed to building a better teaching model and discussing its elements, including teaching contents, teaching resources, teaching strategies, and teaching evaluation. Therefore, to establish a new teaching model it is necessary to study how to construct these teaching elements organically. So, the important questions to be asked here are how to construct the fifth teaching element and how to study the new teaching model empirically. To achieve this goal, firstly the characteristics of PBL and technology should be theoretically studied, and secondly, the new teaching model should be designed systematically. Finally, the teaching model should be verified and improved by a specific course teaching, and a PBL implementation scheme with good generalisability should be given.

Regardless of all the positive aspects that have been mentioned, it cannot be denied that problems and difficulties in the implementation of these approaches do exist. For example, when implementing Web-Based activities, many teachers take online learning as a supplement to traditional teaching and fail to change the traditional classroom teaching (Zheng et al., 2018). Moreover, learners may not get timely feedback and guidance from teachers in the process of autonomous learning and lack effective collaboration and supervision management (Zheng et al., 2018). In the implementation of PBL, there are also problems such as less communication and cooperation between teachers and students, and the difficulty in evaluating students’ learning processes (Bilgin et al., 2015; Zhou et al., 2016).

2. Planning and development of digital activities to innovate and embrace inclusive students’ diversity

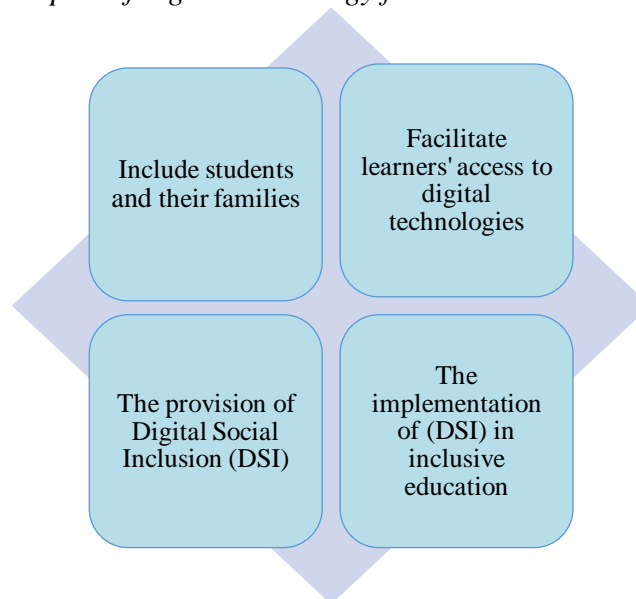
ICTs have progressed rapidly in the last few decades, which has influenced the education domain by the integration of these new technologies into projects and courses. More significantly, it is required that innovation in education carry out the current change that is happening in the world to be able to solve educational complications efficiently (Whattananarong, 2011). High-quality educational innovation can improve students’ learning skills and allow them to learn more in a shorter time.

Kanchanachaya et al., (2012) addressed the actual preservice instructor pre-planning courses, particularly those involving the creation of educational media for practical teaching, and he proposed that several key components, such as analytical thinking, critical thinking, opinion sharing, expressing rational ideas, and open-mindedness development, should be considered when designing courses.

Indeed, when a variety of motivating media are used, they instantly support learning by providing opportunities for learners to acquire new knowledge and investigate information from different resources whenever and wherever they are. Padkasem (2013) recommended the use of technology as well as other approaches such as PBL, role-modelling, and service-learning in classroom teaching to engage students in active learning.

The European Agency (2014) recommended the use of digital innovations by developing a pervasive culture of innovation in all areas of education as well as professional training because technology skills are now indispensable for global citizenship and for students, particularly those with special needs, who are vulnerable to the digital divide and exclusion from some educational opportunities. According to Abdous et al., (2009) technological innovation represents both opportunities and challenges for inclusive education. Such digital innovation aids in the preparation of learners from different backgrounds (with immigrant backgrounds, with disabilities, from poor families and rural areas) with the necessary skills that help them integrate into education. Planning and developing technological activities for students with intellectual disabilities or specific learning problems involves removing physical, content, and cognitive barriers. However, the use of these digital items for students' integration necessarily requires a wide range of skills from teachers (European Agency, 2014). Figure 1 indicates the principles of digital technology for inclusive education.

Figure 1. *Principles of digital technology for inclusive education*



Source: own elaboration

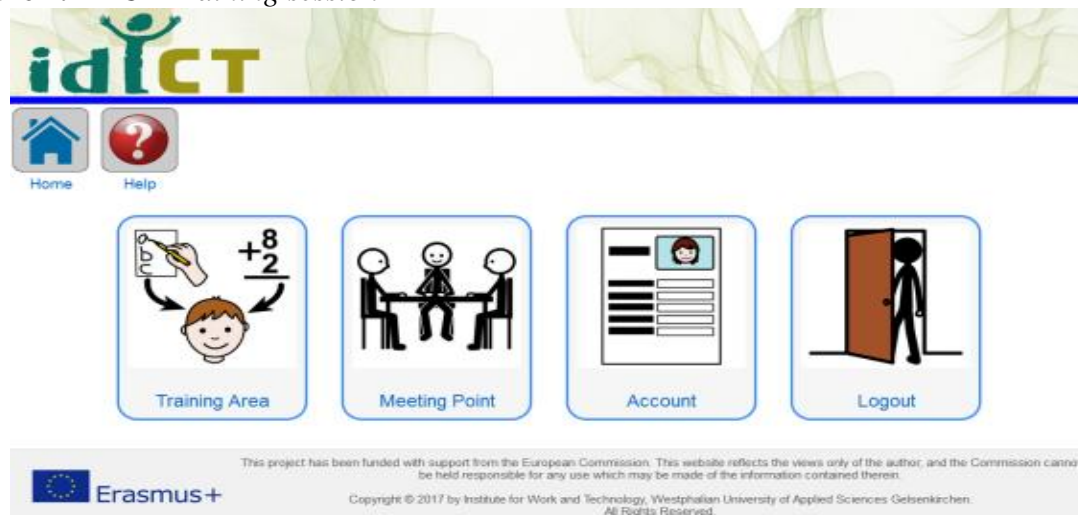
The challenge is to use technology to improve and revolutionise learning to raise students' interests and motivation. It is suggested that instructors implement learner-centred apps in which their pupils can manipulate or generate innovative information or learning products. This ability will transform student learning to produce content, particularly for learners with special needs (Haburg, 2015; Gonzalez, 2014). Therefore, teachers should be trained to gain experience in facilitating the use of content creation or support apps so that their role will be to ensure that students can explore their learning.

The first type of app (content creation) is learner-centred; students can produce or manipulate their content. Otherwise, the second type of app (support) is utilised in the curriculum to support precise areas, such as reading ability, communication skills, and leisure. For a student having trouble with decoding, an app that converts text to speech could be considered useful either in the classroom or at home.

Many students with different learning characteristics can benefit from using text-to-speech apps as support in the classroom (Gonzalez, 2014). Many apps can be used to create customised learning activities for students with disabilities. However, it is essential to determine the types of difficulties a student is experiencing. For example, if they are having difficulty with reading, then the appropriate app should be selected to resolve this issue.

The Erasmus+ project “Intellectual Disabilities and Information and Communication Technology (IDICT)” was created to develop a comprehensive training programme for participants in an ICT environment by using suitable apps to develop the competencies of students with special needs, integrating them into inclusive education and motivating them to access a usable digital and interactive training platform supporting the training methodology linking to select digital tools and apps and other software, screenshot (Figure 2).

Figure 2. IDICT Training session



Source: The Erasmus+ project IdICT (2015). *IDICT Training session*
[screenshot] <http://apps.id-ict.eu/en/home>

When students use this platform, they can choose the type of activity they prefer, such as communicating with others, learning how to cook, or any other activity, using their phones, tablets, or computers. If they choose to cook, they must follow the practical instructions of the app. After that, they can choose the recipe they prefer and follow the guidelines that the app offers, such as recipe photos and videos, on which they need to click to see how to prepare their meal step-by-step, and shopping lists for the ingredients they need to buy from the supermarket, either with the help of their parents or by using the app Google Maps to reach it, a sample of this app is shown in Figure 3.

Figure 3. A Sample of App Kitchen Stories



Source: The Erasmus+ project IdICT (2015). *Sample of App kitchen stories*, [Screenshot] <http://apps.id-ict.eu/en/training-content/thebestapp/list-of-results/app-kitchen-stories>

3. Using podcasts as a source of inspiration for language learning during the fast-paced technological era

English is a common language and one of the most widely spoken languages currently. Therefore, when addressing foreign language learning, it is undeniably broadly studied. Still, in many countries, traditional approaches are used in the teaching and learning of English, such as the intensive focus on teaching vocabulary and grammar. Indeed, these approaches are less commonly used in the development of oral skills than in the case of speaking and listening. Additionally, these skills are hardly motivated outside of the classroom, which can create a lack of self-confidence and increase anxiety when students use a foreign language (Hamzaoglu & Koçoglu, 2016). There is a negative influence on students' motivation when it comes to learning a foreign language, which is due to insufficient contact with the target language (Doiz et al., 2014).

Doiz et al., (2014) defined "opportunities" as "new prospects" in which the learning is animated with digital tools and innovative methods such as "hands-on PBL," "new inquiry and knowledge production," cultivate a technology-enhanced generation of "humanists" when specialists collaborate across disciplines. According to Oskoz (2020), teachers motivate and engage students in technology-enabled projects to help them learn, such as collaborative writing via Wikis, telecollaboration between students from different countries via Google+ and, Skype,

and the use of educational social platforms like Ning to achieve meaningful participation, grammatical skills, and digital competency.

One of the appealing technological tools is podcasts. This term first appeared in 2004 and was mentioned as “Word of the Year” in 2005 by the New Oxford Dictionary (Kavaliauskienė & Anusienė, 2009). There are many definitions of the word podcast, and the most widely accepted is a combination with the words “iPod” and “broadcast” (Chacón & Pérez, 2011; McLoughlin et al., 2007; Sevilla et al., 2018). They are frequently MP3 format recordings that can be automatically downloaded and listened to on a variety of digital devices, including laptops, tablets, and smartphones, which are linked to a web feed that provides users with frequently updated content that deals with different fields, such as sciences, art, or technologies (Seville et al., 2018).

In the last few years, podcasting has become popular and has been used in the teaching of English at all educational levels and in different settings. For example, many teachers use them to help learners with difficulties or to further develop advanced learners, deliver recorded lectures and speeches, facilitate self-paced learning, and enrich distance learning (Kavaliauskienė & Anusienė, 2009). Furthermore, when using podcasts to learn English, students can choose their favourite podcast episodes, channels or topics, which broadens the learning style options and enhances their linguistic skills, especially in vocabulary, idioms, oral communication, and listening, in a more user-friendly manner (Anissa & Suryaman, 2021).

Podcasts are enjoyable and flexible media that can contribute to learning English autonomously during this pandemic, as they can be listened to anytime and anywhere from a variety of sources such as YouTube, Spotify, Soundcloud, or other apps such as the British Council that provide an online programme for daily different English practice styles. For example, everyday English, business, news, grammar, punctuation, and vocabulary, in addition to rooms and spaces for teachers with different content, and students’ learning spaces that include listening to podcasts and episodes. The app sends automatic notifications of the updated podcast “Learn English from Home series” episodes that appear on top of the phone screen so that students can listen to and learn about different topics and cultural events.

On the other hand, to increase English learning, students should listen to different listening materials on various themes and topics to become familiar with texts of different structures and levels. Yoestara and Putri (2019) state that the most complicated skill to be taught in English is listening since it needs more listeners’ focus and concentration.

Furthermore, the instructor encourages and enables students to develop life-long learning skills by involving them in the process of creating and sharing podcasts. Certainly, these skills help students thrive in today’s digitally and globally interconnected world (Howlette & Waemusa, 2019). Because most foreign language students, Yoestara and Putri (2019) pointed out, are unable to hold a fluent conversation due to a lack of vocabulary and grammar, it is critical to select a topic that is neither too difficult nor too easy based on students’ interests, to peak their curiosity and suit their abilities.

The experience of learning English in school life should be based on constructive motivational methods that enable learners to appreciate both the fun of learning as well as the hardship. Thus, to design a more rigorous and attractive podcast assignment, the teacher must manage the instruction in a way that students can understand from the beginning why and how the project is significant and relevant to them. This replication demonstrates students' inspiration when they are satisfied with the effectiveness and efficiency of their learning. Certainly, this will remain a valuable experience for their life-long English learning journey.

4. Results and Discussion

During the examination of podcast efficacy in developing students' linguistics skills and motivation through using podcasts. Regarding the students' perceptions toward utilizing podcasts to learn English listening skills, it was found that 70% of the students who participated in the study strongly agree that listening to podcasts supports intensifying their vocabulary. Additionally, almost 50% of these students accept as true that podcasts motivate their English learning. Otherwise, 25% of them claimed that they found it confusing to choose among the interesting podcasts and 70% found podcasts as an enjoyable experience. Table 1 highlights the main results.

Table 1. *The level of developing students' linguistic skills through podcasts*

№	Questions	Responses			
		Strongly Agree	Agree	Not Sure	Disagree
1.	Listening to Podcasts improves my English listening skills	70%	30%	0%	0%
2.	Listening to podcasts improve my vocabulary	70%	70%	0%	0%
3.	Listening to podcasts increase my motivation to learn English	50%	50%	30%	0%
4.	It is easy for me to find podcasts that match my interests.	40%	25%	30%	0%
5.	Listening to podcasts is an enjoyable experience.	70%	30%	0%	0%

These findings are linear with those found by Adzkiya & Suryaman (2021) who in their examination of podcast efficacy in developing students' linguistic skills and motivation through the use of podcasts that 60% of the students who participated in the study strongly agree that listening to podcasts helps in expanding their vocabulary. Additionally, almost 50% of these students believe that podcasts motivate their English learning.

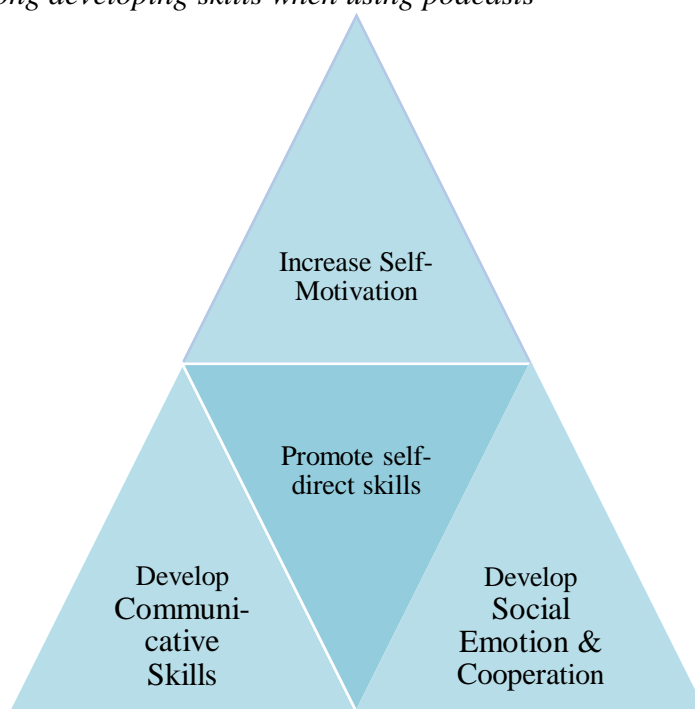
When students were asked about the challenges they face when using podcasts, the most challenge was the accent of native speakers and the speaking pace as well as the use of some complex or unfamiliar words structure like idioms (Table 2).

Table 2. Challenges Students’ face when using podcasts

Challenges	Students’ comments
Accent	“British accent sometimes it is hard for me to catch the meaning”
Unfamiliar words	“Many unfamiliar words”
Language	“Native speaker speech rate”

To summarise, the use of podcasting in English teaching and learning has the potential to help students advance different important skills (see Figure 4).

Figure 4. Lifelong developing skills when using podcasts



Source: Own elaboration

Additionally, using podcasts enhances students’ digital competence, increases motivation and confidence, provides educational entertainment value, and improves listening comprehension, vocabulary, pronunciation, grammar and writing skills (Abderrahman et al., 2018). They also boost students’ autonomy, promote second language learning, and personalise learning process (Sevilla, 2018), easy and constant accessibility (Bolliger et al., 2010; Chan and Lee, 2007; Stoltenkamp et al., 2011; Sutton-Brady et al., 2009). Improve students’ communicative skills by generating podcasts (Ramli & Kurnianwan, 2017).

5. Supporting projects by integrating multimodal digital practices into the context of English pedagogy

PBL experts have advocated different sources of scaffolding approaches, mostly concerning language use. Multimodal scaffolding strategies incorporating verbal and visual resources are gaining popularity since they are viewed as potentially useful tools for mediating PBL. Indeed, CPBL in the English classroom can be empowered by using a wide range of multimedia tools and applications, such as Quizlet, Pear Deck, Flip Grid, Padlet, and many other instructional technologies that enhance students' linguistic skills and heighten their motivation and interest in learning. Knowledge is fast becoming a powerful engine in life; therefore, innovations and inventions are the building blocks of developing a knowledgeable human society. Certainly, appropriate use and comprehension of technological tools can lead to the creation of a successful learning atmosphere that expands beyond the limits of time and space (Oskoz & Gimeno-Sanz (2020).

Today, more than ever before, it is deemed necessary for educators to create a perfect multimedia environment in their classrooms to prepare their students for a complex world and to make their teaching methodology the most effective and efficient in their field (Gua et al., 2020; Kahyaglu & Saracoglu, 2018). The need to master the use of technological features is becoming essential. Teachers in all content areas are obliged to become fluent users of digital resources (Alexander, 2020).

This generation of students is overwhelmed by technological devices (Hofer & Owings-Swan, 2005). So far, these technologies are not being used the way they should be used inside the classroom. Since, in most cases, students are not able to contribute to building their learning using these technological features. Otherwise, guiding students to produce digital movies offers an opportunity to blend their use of technology and attract their attention to learning English. Mitchell & Rogers (2020) indicated the various advantages of creating multimodal films; their findings revealed that the process of producing videos cultivated students' multiliteracies in different aspects and extended their perception of the interaction between different representative resources and means of construction.

Movie making is a PBL activity that can be defined as using multiple forms of media, such as photos, sounds, narration, images, etc., to deliver certain understandings (Hofer & Owings-Swan, 2005). Research has reported numerous outcomes of video-making activities. Hoffenberg and Handler (2001) found that making videos increases students' motivation and enjoyment. On the other hand, they pointed out that it enhances students' creativity by promoting meaningful learning and facilitating students' understanding of the subject matter.

Shadiev & Yang (2020) argue that in our days, Facebook, Twitter, Instagram, and WeChat are well-known as social networking media and powerful tools for non-English native speakers who are inspired to use them in their English language learning, especially speaking skills if they are used moderately. Shadiev & Yang (2020) examined the multilingual writing of a Serbian university scholar on Facebook. The study indicates different ways of English language is used by those students, videos, and images to improve pronunciation while communicating

with other people around the world. The results of this study show that students achieved both beneficial advancement and a high level of participation in their learning. Additionally, it is important to know how to make the technology appealing to learners for both socialising and learning. Moreover, the issue of privacy and surveillance is also important to keep in mind.

The results of this study regarding technology-enhanced language learning and teaching, outlined important information about the number of published articles in a specific group of journals to show the dynamics of technology-assisted language learning from 2014 to 2019 (see **Table 2**), and English was the most frequently used language in reviewed articles.

Table 2. *The Dynamics of Technology-assisted Language Learning from 2014 to 2019*

	2014	2015	2016	2017	2018	2019	Total
CALL	9	14	28	16	18	15	100
LLT	17	11	9	19	14	12	82
ReCALL	10	7	8	15	7	12	59
SYSTEM	5	6	6	7	3	11	37
ET&S	4	6	4	8	13	1	36
C&E	5	2	4	3	9	7	30
ETR&D	1	6	1	2	5	3	17
ILE	0	4	6	4	1	3	17
BJET	2	2	1	5	2	2	14
IEEE TLT	0	0	2	1	0	0	3
Total	53	58	69	80	72	66	398

According to Shadieff and Yang (2020), in 398 articles, 93 kinds of technological features were used 406 times. However, a potential overlap in these categories was noticed. For example, three types of these technologies exist, which are games, virtual reality, and wearable devices. Students in a game-based learning environment may play games using wearables or virtual reality. Nowadays, it is believed that games are among the main concerns of young adults when most of them play during their recreation time (Chen, 2018).

In this study, we made a comparison between technology use across timeframes (before, during, and after 2014-2019), referred to as “old technologies still in use and new technologies” (Table 3).

Table 3. *A comparison between technology across different timeframes: old, still in use and new*

Old	Still in Use	New
Course management system	Game	Online video
Whiteboard	Corpus	e-Books
ePortfolio	Automated feedback	Voice recording

Internet forum or message board	Social networking	Augmented Reality
iPod	Instant messaging	Robots
Digital library	Virtual reality	Wearable devices
	Websites and digital resources	
	Speech recognition	
	Collaborative writing	
	Electronic gloss or annotation	
	Intelligent tutoring system	
	Electronic dictionary	

All the previous-mentioned learning technologies and others provide a variety of benefits such as interactivity, adaptivity, feedback, choice, nonlinear access, linked representations, open-ended learning input, and continuous communication with others (National Academy for the Sciences, Engineering and Medicine, 2018).

6. Conclusions

To sum up, embedding digital technologies into the CPBL empowers students with important skills. These skills make them ready to continue their learning process regardless of all the circumstances they may encounter. Students can work autonomously when they are used to work on projects. In this sense, students investigate information, use technologies, organise their findings, discuss and analyse ideas, and build their knowledge independently.

In today’s world, technology and language learning abilities appear to be vital for continuing the learning process and achieving success in the labour market, particularly during COVID-19 and emergencies. Foreign language acquisition has been practised since ancient times, with a wide range of pedagogical approaches. The EU has pushed for the use of linguistic proficiency-building programmes and active methodologies in the teaching and learning of languages. CPBL and technology integration should have a beneficial influence on students’ outcomes, especially in the learning of language knowledge acquisition, particularly at the level of oral productive, comprehensive, and communicative abilities, fostering autonomy in learning how to learn or showing initiative, and developing critical thinking.

Indeed, the uncertain situation of COVID-19 that the world has been living in since late 2019 makes in-person education impossible from time to time, due to the social distancing imposed by the pandemic to avoid the virus infection. Consequently, different types of educational settings have emerged, the most important of which is ERT, which depends mainly on the use of modern technologies to communicate with learners in different situations. This type of education ran into several challenges, the most important of which was the lack of preparedness of teachers, in some cases, or their lack of familiarity with modern teaching methods that required the use of the latest means of communication in education.

Despite that, to make the ERT successful and beneficial for students, teachers should be provided with opportunities to develop their online and blended teaching competencies through

designing online forums and mentoring, they can be fully prepared to teach in a variety of formats, situations, and places (Archambault & Kennedy, 2014; Barrault et al., 2019; Pulham & Graham, 2018; Zweig & Stafford, 2016). Additionally, motivating educators to develop digitally enhanced professional learning networks to support ongoing learning and progress in technology-assisted teaching is significant (Trust et al., 2016). Learner-centred, socially connected activities allow educators to gain knowledge and skills to assist them to teach with technology in all cases or contexts, including online, remote, or blended settings (Whalen, 2020).

Besides, the integration of high quality and quantity of technology into the curriculum is of considerable importance (Trust et al., 2016). When teachers are well-trained and offered the necessary materials, they can be more creative and effective users of technology, which can facilitate their work and their students' results.

In their study, Pulham & Graham (2018) mentioned relevant positive student outcomes when hybrid online-flipped learning pedagogy was used during pandemic COVID-19 confinement. They stated that there was a significant decrease in the academic gap among students because of the potential of this approach to mitigate the negative effects of discontinuing face-to-face teaching on learning outcomes and help mitigate the sudden change in teaching methods from face-to-face and hands-on practice to online, as well as to support the unfamiliar migration to online teaching platforms. Furthermore, the authors ensured the improvement of students' cooperative learning, autonomous learning, critical thinking, and communicative discussion skills in the online sessions.

To sum up, in modern educational settings, skilful teachers are those who reorganise, facilitate, and stretch student learning, and who foster creativity and real-life problem-solving (Hargreaves, 2013). Allowing students to demonstrate their abilities in constructing their project cooperatively relying on their knowledge of technology and under the guidance of their teachers can greatly enhance their learning independence, which will enable them to lifelong learning without the condition of place or time or under any circumstances of emergency or urgency.

References

- Abdous, M. H., Camarena, M. M., & Facer, B. R. (2009). MALL technology: Use of academic podcasting in the foreign language classroom. *ReCALL*, 21(1), 76-95.
- Adzkiya, D. S., & Suryaman, M. (2021). Use of Google Site Learning Media in English Class V Elementary School. *Educate: Journal of Educational Technology*, 6(2), 20-31.
- Alexander, J. C. (2020). *Sociología cultural: formas de clasificación en las sociedades complejas*. FLACSO Mexico.
- Anissa, H., & Suryaman, M. (2021). Students' Perception of Utilizing Podcasts to Learn English Listening Skill. *Eduvelop: Journal of English Education and Development*, 5(1), 44-49.

- Archambault, L., & Kennedy, K. (2014). Teacher preparation for K-12 online and blended learning. *Handbook of research on K-12 online and blended learning*, 225-244.
- Barrault, L., Bojar, O., Costa-Jussa, M. R., Federmann, C., Fishel, M., Graham, Y., ... & Chacón, C. T., & Pérez, C. J. (2011). El podcast como innovación en la enseñanza del inglés como lengua extranjera. *Pixel-Bit. Revista de Medios y Educación*, (39), 41-54.
- Bilgin, I., Karakuyu, Y., & Ay, Y. (2015). The effects of project based learning on undergraduate students' achievement and self-efficacy beliefs towards science teaching. *Eurasia Journal of Mathematics Science and Technology Education*, 11(3).
- Chen, D. (2021). Producing Podcasts in a Chinese Classroom: A Digital Humanities Project, *Chinese Language Teaching Methodology and Technology*, 4(1), 27. Available at: <https://engagedscholarship.csuohio.edu/cltmt/vol4/iss1/3>
- Doiz, A., Lasagabaster, D., & Sierra, J. M. (2014). CLIL and motivation: The effect of individual and contextual variables. *The language learning journal*, 42(2), 209-224.
- González, C. S. G. (2014). Estrategias para trabajar la creatividad en la Educación Superior: pensamiento de diseño, aprendizaje basado en juegos y en proyectos. *Revista de Educación a Distancia (RED)*, (40).
- Hamburg, D. A. (2015). *A Model of Prevention: Life Lessons*. Routledge.
- Hamzaoğlu, H., & Koçoğlu, Z. (2016). The application of podcasting as an instructional tool to improve Turkish EFL learners' speaking anxiety. *Educational Media International*, 53(4), 313-326.
- Hargreaves, A., & Fullan, M. (2013). The power of professional capital. *The Learning Professional*, 34(3), 36.
- Howlett, G., & Waemusa, Z. (2019). 21st Century Learning Skills and Autonomy: Students' Perceptions of Mobile Devices in the Thai EFL Context. *Teaching English with Technology*, 19(1), 72-85.
- Kanchanachaya, N., Suwannatthachote, P., & Suwanmonkma, S. (2012). How to enhance creative problem solving in instructional media production assessment course: a finding from needs. *Academic Services Journal, Prince of Songkla University*, 23(2).
- Kim, H., & Kwon, Y. (2012). Exploring smartphone applications for effective mobile-assisted language learning. *Multimedia-Assisted Language Learning*, 15(1), 31-57.
- Kanchanachaya, N., Suwannatthachote, P., & Suwanmonkma, S. (2012). How to enhance creative problem solving in instructional media production assessment course: a finding from needs. *Academic Services Journal, Prince of Songkla University*, 23(2).

- Kavaliauskienė, G., & Anusienė, L. (2009). English for specific purposes: Podcast for listening skills. *Coactivity: Philology, Educology*, 17(2), 28–37.
- McLoughlin, C., & Lee, M. (2007). Social software and participatory learning: Pedagogical choices with technology affordances in the Web 2.0 era. In *ICT: Providing choices for learners and learning. Proceedings ascilite Singapore 2007* (pp. 664-675). Centre for Educational Development, Nanyang Techn....
- Mitchell, J. E., & Rogers, L. (2020). Staff perceptions of implementing project-based learning in engineering education. *European Journal of Engineering Education*, 45(3), 349-362.
- Oskoz, A., & Gimeno-Sanz, A. (2020). Exploring L2 learners' engagement and attitude in an intercultural encounter.
- Padkasem, N., Niyomsrisomsak, S., & Rodjarkpai, Y. (2013). The strategies in developing students' characteristics according to learning outcomes of general education at Burapha University. *Journal of Education and Social Development*, 9(1), 44-54.
- Pulham, E., & Graham, C. R. (2018). Comparing K-12 online and blended teaching competencies: A literature review. *Distance Education*, 39(3), 411-432.
- Saraçoğlu, M., & Kahyaoğlu, M. (2018). Investigation of secondary school students' perceptions of scientific inquiry skills in terms of curiosity, motivation and attitude. *Journal of Computer and Education Research*, 6(12), 358-376.
- Sevilla Santo, D. E., Martín Pavón, M. J., & Jenaro Río, C. (2018). Actitud del docente hacia la educación inclusiva y hacia los estudiantes con necesidades educativas especiales. *Innovación educativa (México, DF)*, 18(78), 115-141.
- Shadiev, R., & Yang, M. (2020). Review of studies on technology-enhanced language learning and teaching. *Sustainability*, 12(2), 524.
- Trust, T., Krutka, D. G., & Carpenter, J. P. (2016). "Together we are better": Professional learning networks for teachers. *Computers & education*, 102, 15-34.
- Usher, M., & Barak, M. (2018). Peer assessment in a project-based engineering course: Comparing between on-campus and online learning environments. *Assessment & Evaluation in Higher Education*, 43(5), 745–759.
<https://doi.org/10.1080/02602938.2017.1405238>
- Whalen, J. (2020). Should teachers be trained in emergency remote teaching? Lessons learned from the COVID-19 pandemic. *Journal of Technology and Teacher Education*, 28(2), 189-199.

- Whattananarong, K. (2011). Innovation and technical education technology. *Bangkok, Thailand: King Mongkut's University of Technology North Bangkok*.
- Yaman, S. G., Fagerholm, F., Munezero, M., Münch, J., Aaltola, M., Palmu, C., & Männistö, T. (2016). Transitioning towards continuous experimentation in a large software product and service development organisation—a case study. In *Product-Focused Software Process Improvement: 17th International Conference, PROFES 2016, Trondheim, Norway, November 22-24, 2016, Proceedings 17* (pp. 344-359). Springer International Publishing.
- Zampieri, M. (2019, August). Findings of the 2019 conference on machine translation (WMT19). ACL.
- Zheng, Z., Xie, S., Dai, H. N., Chen, X., & Wang, H. (2018). Blockchain challenges and opportunities: A survey. *International journal of web and grid services, 14*(4), 352-375.
- Zweig, J., & Stafford, E. (2016). Training for online teachers to support student success: Themes from a survey administered to teachers in four online learning programs. *Journal of Online Learning Research, 2*(4), 399-418.