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# SUCCESSFUL DIGITAL RESOURCES TO ENHANCE ENGLISH LESSONS

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## Abstract

This article presents an overview of the development of education by looking at the models of Education 1.0 to 5.0 and their pedagogical implications regarding digital tools today. It is undeniable that digital resources play a wider role today when considering their applicability for developing skills in the English learning process, in both online and face-to-face instructional methods. Examples of digital tools include original activities proposed for both elementary and high school students as well as students in higher education. Literature discussion and the authors' viewpoints on the matter show that the tools have proven to enhance the teaching and learning of English and develop social-emotional skills in times of Emergency Remote Teaching (ERT).

**Keywords:** Education 1.0 to 5.0; English Teaching; Digital Resources; Repurposed Tools; Social-emotional skills

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## 1. Introduction: highlights of Education 1.0 to Education 5.0

Experts have emphasized the need to prepare today's students for tomorrow's knowledge society, a society in which conceptual understanding and the generation of new ideas and narratives predominate and are sovereign (Magana, 2017; Tucker, 2017; Watson, 2017).

From an anthropological perspective, it can be said that humans have always lived in knowledge societies, for, as sentient beings, they adapt and advance, becoming tireless learners. Our ability to create and think critically has made it possible for us to survive in various environments, including hostile ones.

In the Middle Ages, education was practiced mainly in monasteries. Only the nobles and intellectuals of the time were entitled to learn. The model of instruction developed in the monastic schools in Europe is referred to as pedagogy or teacher directed. Young boys were taught by monks according to a system of instruction that required these children to be obedient, faithful, and efficient servants of the church (Knowles, 1984).

In the pedagogical model, the teacher had full responsibility for making decisions about learning (content, methodology, evaluation), and the model placed the student in a submissive role, requiring obedience to the teacher's instructions (Hiemstra & Sisco, 1990). Education 1.0 then started to emerge as a traditional teaching method that developed basic knowledge of content and behavior.

The teacher transmitted all the content, and the student just listened, not having the right to participate or express his opinions. Thus, in this model, the learning system was based on listening to the teacher, taking notes, studying the texts read in class, and reproducing analyses and thoughts similar to those of other students. This model also included home education conducted by parents or family members, i. e., people who did not necessarily have formal education for teaching and shared knowledge from books believing that memorization and repetition meant learning efficiency.

Education 2.0, on the other hand, took on the characteristics of an andragogical teaching orientation, in which the principles of active, relevant, and socially networked learning experiences are built into the class or course structure.

The andragogical model is a process that provides procedures and resources for helping learners to acquire information and skills. In this model, the teacher is seen as a facilitator, change agent or consultant, who prepares a set of procedures for learners (Holmes & Abington-Cooper, 2000, p. 17) that includes:

(a) Establishing a climate conducive to learning.

(b) Creating a mechanism for mutual planning.

(c) Diagnosing the needs of learning.

(d) Formulating program objectives (content) that will satisfy these needs.

(e) Designing a pattern of learning experiences.

(f) Conducting these learning experiences with suitable techniques and materials.

(g) Evaluating the learning outcomes and re-diagnosing learning needs.

However, with the arrival of the internet and globalization in the 20th century and with the exponential technological-digital growth of the 21st century, education has changed considerably, giving rise to a new model focused on creativity, innovation, and group work. Education 3.0 is the name of this new paradigm and represents the third generation of education, which prepares students for success in the highly technical job market. Easy access to a substantial amount of information, through technology and the internet, has transformed teaching and learning: students, teachers, and schools participate together in the learning process. In this education, the teacher welcomes the students, encouraging them to expose their wishes, doubts, and opinions about the world, making it different from 2.0 education.

In Education 3.0, educators and students work together to build teaching, using real-life examples through different technologies such as videos, podcasts, and social network. The main pillars that support Education 3.0 are: (a) the integration between the subjects, (b) collaboration between students and teachers, (c) the construction of knowledge through the participation of all, (d) students' active role, ( e) the development of critical thinking, (f) the ability to work as a team and to solve real-world problems (soft skills), and (g) the multiple intelligences proposed by Gardner (1983) that enable customization and personalization of teaching.

As for Education 4.0 and Education 5.0, there has been some insertion, albeit moderate, of technical aspects related to these generations**.** It does not mean to say, however, that many features of Education 3.0 have become obsolete overnight. They will continue to exist for a long time, as they encompass some particularities of the so-called soft skills mentioned above, very widespread among recruiters in the current job market.

By looking back at the history of this evolution, it is possible to see that the development and expression of human knowledge experienced two disruptive periods: the first was the invention of the printing press, and the second, the emergence of electricity (Magana, 2017). According to the author, this new digital age will enable the exponential growth of an interdependent and globally connected network and contribute to new concepts and notions of human knowledge and thought. Thus, it is undeniable that humans stand out because of their extraordinary ability to develop and apply disruptive technologies, making their lives easier and better, and accumulating knowledge for future generations.

Bower and Christensen coined "disruptive innovation" in 1995 and defined it as transformative technologies in the industry. In education, it means to change paradigms, beliefs, and trends. For us, it means to change the way education perceives technologies so that they can add high value to the lives of students and teachers.

Disruptive technologies are accessible, intuitive, and self-explanatory. They describe a new way of teaching by integrating meaningful pedagogical and technological principles that elevate educational practices and maximize the learning of students of digital generations, particularly those known as

Generation Y (Old and Young Millennials)[1], who are now between 18 and 34 years old. In a broader perspective, it inserts students of this age group in the so-called Revolution 4.0 and Revolution 5.0, linked to the technological revolution that includes computational language, artificial intelligence, and the internet of things. This innovation sees learning by doing, experiencing, and valuing cognitive skills, empathy, and socio-environmental awareness.

Web 4.0 is the symbiotic web. The symbiosis is between artificial and human intelligence and how they interact and gain experiences from each other; they become a team— learning from each other. In education, now called Education 4.0**,** students must transform themselves into people capable of innovating and managing technology. However, it is not only that. They need to develop, more broadly, socioemotional skills (soft skills) to improve the society in which they live. Education that should be already personalized has an important ally, artificial intelligence, which increases the reach of customization and personalization because it relies, among other things, on data-wise and feedback automation, for example. The systems begin to understand where the students are inserted: the idea is that they do participate, know, learn, explore, and create.

The Web 5.0 and Education 5.0, which were inspired by Society 5.0, originated in Japan in 2016. The idea launched was to use technology not only to increase production but also to offer more quality of life and actions that are relevant to society. In this sense, technology began to be used productively and to create situations and technological productions to transform the reality of some people and communities, especially in the face of the pandemic. Then, social protagonism enters the scene, in which thinking about the common good and developing empathy have become fundamental and that is why considerable change will probably be experienced in the short run.

This section provided an overview of the evolution of technology regarding the models of Education 1.0 to 5.0 and some pedagogical implications stemming from the different generations. The next sections describe the digital tools used by the authors in the teaching of English by considering their applicability for developing skills in the English learning process, which may be included in both online and face-to-face education. The different stages of tech evolution are also discussed in the light of the activites suggested for each tool. The original tasks were applied in both elementary and high school classes as well as higher education groups and have proven to foster English learning, and to develop social emotional skills in times of Emergency Remote Teaching (ERT).

## 2. Digital tools for English teaching: introduction

Current educational systems – 3.0, 4.0, and 5.0 – understand technology as needful for teaching purposes in the 21st century. The field of Natural Language Processing[2] – a branch of computer science – has developed pieces of software that contribute to several teaching practices, including language ones.

The COVID-19 pandemic outbreak reinforced the importance of using technological tools wisely, mainly because of the amount of time teachers and students have spent in front of a computer attending online classes. Choosing which digital tool is proper for teaching practices among almost-endless options is a challenge and learning how to use them takes time and support from educational contexts.

Using technology purposefully can bring about meaningful classroom experiences as it provides premisses that are considered beneficial to both teachers and students of this century. They are:

(a) Active learning: directly related to engagement, it is one of the core characteristics of a modern educational system. This kind of learning puts the students – as the name suggests – in roles as protagonists of the learning process, involving them with reflective discussions, activities, and practices. Active methodologies also narrow the gaps in the learning achievement of a higher number of students, as Theobald *et al.* (2020) point out;

(b) Formative assessment: when tools and apps allow teachers to see their students' inputs in real-time, they make it easier for educators to use such inputs to adapt the teaching path, giving real-time insight, which in turn enhances the relationship between questioning-timing-answering (Bitter & Loney, 2015);

(c) Retrieval practice: this educational strategy consists of proposing activities that require students to constantly retrieve mastered content and relate it to new ones. Students understand the importance of learning content instead of just memorizing it for tests, for example. Moreover, this practice prompts students to actively think and use what they have learned and link it to what is being presented (Agarawl & Bain, 2019);

(d) Feedback-driven metacognition: metacognition is the act of reflecting on the thinking process. Teachers should provide students with tasks that encourage content development, planning capacity, monitoring, and learning assessment. These tasks, for instance, help students develop other kinds of meta-skills like metapragmatic skills. The feedback teachers provide students assists them in regulating their cognition skills and reassess their strategies. As some technological tools allow teachers to give personalized and real-time feedback, students can reassess it and improve critical thinking (Agarawl & Bain, 2019);

(e) Emotional skills awareness: as previously mentioned, education 3.0, 4.0, and 5.0 take a deep interest in developing students' abilities by seeing each student as a social human being who shall become a future professional. In language classes, exposition, and interaction (mainly oral) are part of the learning process and should be encouraged by teachers. However, some students cannot produce orally due to anxiety, shame, and a series of other factors. Concerning students' limitations on this matter, Krashen (1987) points out that several emotional variables play a central role when learning a new language (such as confidence, motivation, and anxiety) known as the concept of "Affective Filter" in his Second Language Acquisition Theory. By proposing activities that allow introspective students to produce and interact without exposition, teachers can reach students

who would have trouble learning and developing language skills otherwise. One of the biggest complaints of young students during online classes is the fear of oral skill practices because people other than their classmates can watch them performing the tasks. Luckily, some digital tools have been created to allow students to record their voices and send the audio files straight to their teachers, preventing students from feeling anxious or nervous before their groups;

(f) Deeper learning: according to Bitter and Loney (2015, p. 3), "Deeper learning refers to the combination of a deeper understanding of core academic content, the ability to apply that understanding to novel problems and situations, and the development of a range of competencies, including people skills and self-management". The authors point out that there are competencies students must master to improve academic content and apply these contents to real-life situations. Three domains make part of these competencies: (1) cognitive (deep content knowledge, critical thinking, and complex problem solving), (2) interpersonal (collaboration and communication), and (3) intrapersonal (understanding how to learn and academic mindset development). These competencies help students to be aware of what they have learned and to apply the knowledge in personal and professional contexts;

(g) Adaptative learning: each student has different sets of intelligence. Gardner (1983) calls these different types of intelligence "multiple intelligences," which can trace students' strengths and limitations. Thus, using tools that allow teachers to choose activities based on their students' strengths, weaknesses, and needs enrich their learning experience. As mentioned by Delgado *et al.* (2021), some English class tools can help teachers design different activity paths that automatically adapt themselves based on the students' answers. Hence, tools optimize teachers' time and gathering of data for interpretation and assessment.

In the section that follows, we describe some tools for use in EFL lessons; they provide opportunities to apply the premisses listed above.

## 3. Digital tools in practice: general considerations

This section presents an overview of some tools and activities that were used in online classes during the COVID-19 pandemic. All of them were adopted with groups of fourth, fifth, and sixth graders, and with high school and college students at private institutions in the south of Brazil.

### *3.1 Pear Deck - Interactive Presentations*

According to Gausby (2015), our attention span has been reduced to eight seconds - which means that, when using a presentation tool, a speaker (or teacher) needs to add resources (such as visual aids, rhetorical questions, intonation) to keep the listeners' attention and interaction. A monologue might not be engaging in virtual classes (adults' attention tends to drift away when attending a slide presentation; a child might concentrate even less). Instead of planning a lesson

for students to sit and read slides while listening to the teacher, the latter could adopt an interactive presentation tool to foster classroom engagement.

When wisely used, these interactive presentations can engage students and keep their attention in class. Interactive features, such as Pear Deck, raise students' interest and promote participation.

Pear Deck, an extension of Google Presentations, is a tool designed for teaching purposes, which offers resources that can be added to the slides:

(a) Open questions: students can write words or texts into a box in the presentation;

(b) Multiple-choice questions: students can choose alternatives to multiple-choice questions;

(c) Number inputs: students can add a number to the answer;

(d) Drag and drop: students can move an icon around and place it anywhere on the slide;

(e) Drawing: students can draw using different drawing tools.

Pear Deck was designed based on the educational premisses mentioned in section 2. This tool generates interactivity, stimulates active learning, allows formative assessment and feedback, deepens the learning experience, and filters emotional and social skills (by not exposing the students' answers and keeping the interaction anonymous). When the lesson finishes, teachers have access to a spreadsheet with students' inputs, which can be used for evaluation and personalization strategies.

Cortina Silva, one of the authors of this article, has been using this tool since the pandemic started in 2020, and reported that students' engagement and outcomes – interpreted by the results of activities – have exponentially increased. Students feel more confident and enthusiastic: the tool motivates students to concentrate because they are expected to interact at any point in the presentation.

Studies around the globe have shown favourable learning outcomes with the use online interactive tools such as Pear Deck. One example is the quasi-experimental research conducted by Ni, Jong, Dison, Thomas, Yunus, and Suliman (2020) in rural areas in Malaysia, where they incorporated Pear Deck to engage pupils in individual and social learning. Pre-test, post-test, and survey questionnaire were applied to collect data from 4 rural schools in Sarawak, located in northwest Borneo Island. The study showed that most respondents improved their vocabulary skills (and had better retention of what was learned) as well as soft skills like cooperation and collaboration, communication, creativity, and critical thinking.

As stated in the Introduction, today's students have seen technological breakthroughs in their daily lives, including teaching. Computational language, artificial intelligence, and the internet of things are innovations that see learning by doing and experiencing, and values cognitive and social skills such as empathy, leadership, adaptability, and socio-environmental awareness.

Regarding students' learning experience, both educational contexts – Brazil and Malaysia – have proven that the customization and personalization provided

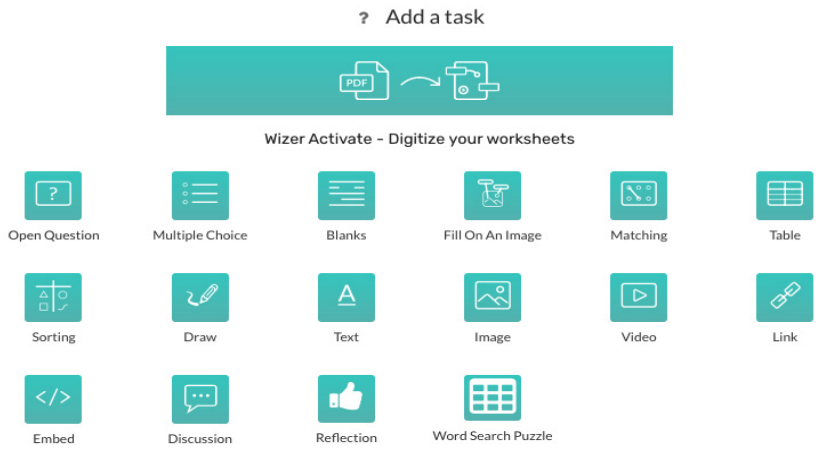
by Pear Deck improved the way students participate, learn, explore, and create. We believe that innovation in educational technologies prepares the ground for the improvement of the society where students live; in the short run, they will become professionals who are aware of the role they play both locally and internationally.

The following tool – which is also interactive – encourages active learning and allows teachers to personalize and customize content.

### *3.2 Wizer.me - Interactive Worksheets*

A tool that helps minimize the use of printed worksheets, for example, is Wizer.me, a resource that allows teachers to create interactive worksheets and add several kinds of activities, such as open questions, fill-in-the blanks activities, sorting elements, matching, and word search. (Figure 1).

**Figure 1:** *Wizer.me Activities*




Different kinds of media like YouTube videos, links, and pdf files can also be added in the worksheet. These resources support teachers in the development of a whole class within the same tool, merging and alternating between content and activities.

One of the biggest benefits of Wizer.me is the possibility of seeing student's progress in real-time. Teachers can see the students' answers as they work and provide instant feedback. In open questions, for instance, students can record their voices, which solves two common problems: time constraints for oral production in online classes and lack of interaction of shy students.

Another useful feature of Wizer.me is the automated feedback. Teachers set the answers for the activities, and students receive automated feedback instantaneously, allowing them to check their answers and reflect on the possible issues or difficulties.

Wizer.me is not only a tool to create interactive worksheets, but it can be used as an active learning tool to help students develop autonomy. Combined

with the activities, teachers can post videos covering the topics, links for further reading, or suggestions of content to be studied, guiding their students to an active-learning practice.

In the online classes, Cortina Silva reported that the number of students who handed in the assignments through Wizer.me was at least twice as many as the number of students who completed tasks on PDF files.

Kopniak (2018, p. 116) analyzed the use of Wizer.me and established that it "entirely corresponds to the peculiarities and principles of distance education. When using worksheets, a student turns from a passive recipient of knowledge into an active participant in the teaching-learning process". Furthermore, the author claims that by using Wizer.me, a great number of financial, psychological, and methodological advantages were achieved, once the software can be easily accessed, and its multiple possibilities – when correctly used – increase the students'confidence.

In our observation, Wizer.me helped with the rapport between teacher and students (due to the easy feedback resource), gave the students the chance of actively engaging in the learning process, and enabled customization and personalization by allowing the teacher to create differenciated activities for specific students.

Summing up, we can say that the tool's functionalities provided learners and teachers with a desired outcome that corresponds to the most valued social-emotional skills of contemporary education.

### *3.3 Gamification and repurposed tools*

Some technological tools were not designed specifically for teaching purposes. Pieces of software like Word and PowerPoint, by Microsoft, were not first developed for a classroom.

Part of teaching is the creative process. When teaching a foreign language, teachers need to use their imagination, design scenarios, and simulate opportunities to help their students to practice the language instead of passively absorbing grammatical explanations. Therefore, even if some teachers do not have a broad knowledge of digital tools, they can repurpose the ones they are familiar with for teaching purposes.

When it comes to Active Learning and engagement, literature about teaching practices has highlighted the importance of gamification tools. Games have been part of classroom practices since before technological tools even existed. However, technology offers a great variety of possibilities, making gamification easier to adopt in class. Nowadays, teachers can access several online games for teaching purposes (Kahoot, Quizlet, Quizizz, EduCandy, etc.), which means to say that Ed-Tech tools have become an endless array of creative, interactive, and personalized subsidies for meaningful lessons. Therefore, creating customization games can be positive for teaching purposes, and it is even possible to design different games using Word and PowerPoint. Since 2010, Microsoft tools have

been available online, which allow multiple users to collaborate and edit the same document. Sharing a Word or PowerPoint document with synchronous users creates possibilities to enhance English lessons, which are shared below.

### *3.3.1 Collaborative texts*

Sharing an online document with multiple editors facilitates the design of collaborative text activities. Teachers, for example, can split students into pairs or groups and give a topic (or the beginning of a text, for example) for them to write a text collaboratively. In addition to developing writing skills, the activity provides learners with social skills development, once they must work together to complete the task and make writing decisions during the process. By using an online document, teachers can see in real time the text being written and add comments and suggestions. As stated above, collaboration is one of the key skills valued by modern education, a desirable quality that applies across a variety of jobs and life situations. According to Gerstein, "collaboration and social negotiation is encouraged among learners" (2014, p.89) in a 3.0 educational system.

### *3.3.2 Interactive games*

Similar to collaborative texts, interactive games may help students improve their social skills along with their linguistic skills by adding the gamification feature to classroom activities. Deterding (2012) claims that gamification leverages both motivation and engagement, which are core abilities to be developed in learning contexts. Presentation tools like PowerPoint usually allow several configurations and designs that can be used to develop games, like the examples below, designed for online classes via Zoom. Alternatively, they can be played in face-to-face lessons when there is a projector or computer available.

Hamari *et al.* (2014) point out that gamification in education offers several positive effects related to cognitive development, and motivational and engagement skills when applied in proper contexts. According to the premises of Education 3.0, 4.0 and 5.0, students should be seen as active actors in the teaching process; they also encourage language teachers to create scenarios and opportunities to boost production of authentic language. The games designed below are examples of how students' motivation can be improved and how they can be stimulated to communicate in English.

#### *3.3.2.1 Board game*

Board games are usually interesting and useful. However, even in in-person lessons, having access to some games is difficult or expensive. By using presentation tools to design board games, teachers can personalize their boards and develop their games. The image below (Figure 2) is an example of a game board created for English classes.

**Figure 2:** *Virtual Personalized Harry Potter Board Game*

The game was used as a review activity and designed using PowerPoint. Cortina Silva split the students into four groups (according to the Harry Potter houses), who had to roll virtual dice. When they landed in a number, a card with an English task was shown for students to do. Because it was designed using a presentation tool, the elements of the board could be easily replaced and/or moved around. To move the pawns around the board, players needed to select the icon that represented the pawn and move it anywhere on the board.

Since it is a personalized game, teachers can use the content topic they find useful and relevant for learners to play; once teachers create one board, they can change the core of the game and reuse the board for different kinds of content.

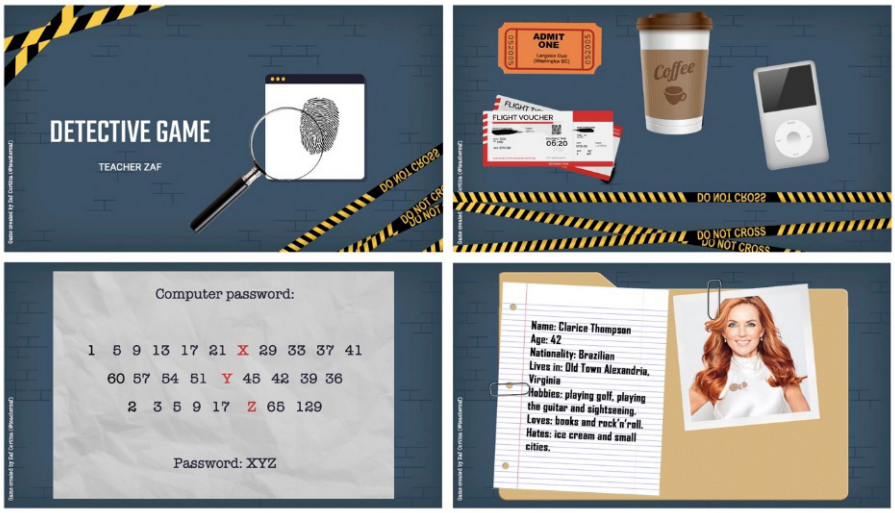
With a group of sixth graders, Cortina Silva used the game as a revision activity, and with another group, he used the game without changing instructions and materials, i.e., a worksheet with original questions and answers. Cortina Silva observed that engagement required by the gamification activity was higher than other traditional types of activity. Students felt not only motivated by the game, but also compelled to find creative alternatives to answer the questions. Regarding language skills, students who played the personalized game were more accurate than the students who answered the worksheet.

Studies like the one carried out by Pitoyo *et al.* (2019) used gamification-based assessment in an English course to overcome test anxiety. A quanti-quali approach for analyzing the data collected (observation, questionnaire, and interview) on students' attitudes and preferences toward Quizizz showed a high reduction in students' anxiety because of the game elements used in testing.

### *3.3.2.2 Case game*

Due to the multiple interaction possibilities of presentation tools, teachers can develop games that are even more complex. The picture below (Figure 3) represents an example of a game developed by Cortina Silva, using PowerPoint.

**Figure 3:** *Case Game (Detective Game)*




Students were divided into groups and each group received a copy of the presentation, which contained information about a fictional crime, files with suspects, elements representing the objects left behind by the thief, some links to external content, and clues. Students had to explore the file to find out who the thief was in a group of ten suspects. Players not only had information about the suspects but could also move objects around and find hidden objects that would lead to important clues (such as a red lipstick behind the coffee cup). They could also scan QR codes that would lead them to other important clues and solve riddles that would give them access to phone calls between the thief and the boss (which was a video on YouTube).

This game repurposed a known tool (PowerPoint) and made it more interactive. Instead of having just a regular presentation with slides, students were able to interact with the activity itself and with each other, develop language skills and communication abilities, and use interdisciplinary knowledge (there were geographical clues about the location of the suspect and mathematical clues to solve riddles).

### *3.3.2.3 Pair game*

The following image (Figure 4) is an example of a game created on PowerPoint by Cortina Silva. It is similar to a classic game (named "Guess who?") and can be played in pairs. Each student received an online presentation with a board containing different characters to be picked for each round; they asked about characters' physical traits to try to guess the opponent's character before being discovered.

It was interesting to observe that students collaborated with each other to improve vocabulary. When the students did not know a specific word, they asked the group, which resulted in a colaborative building of vocabulary.

**Figure 4:** *Virtual Personalized 'Guess Who?'*

Because the game was designed using PowerPoint, students could move elements around and delete pictures to discover the correct answer. This game can be used to present and practice word classes, for instance; teachers can easily replace the pictures and work with varied lexicon (such as using flags of countries, foods, etc.)

### *3.3.2.4 Reimagined classic games:*

Some classic games, such as Detective, Game of Life, and Monopoly can be easily adapted into a presentation tool. The following image (Figure 5) shows an example of Detective transformed into a personalized online version.

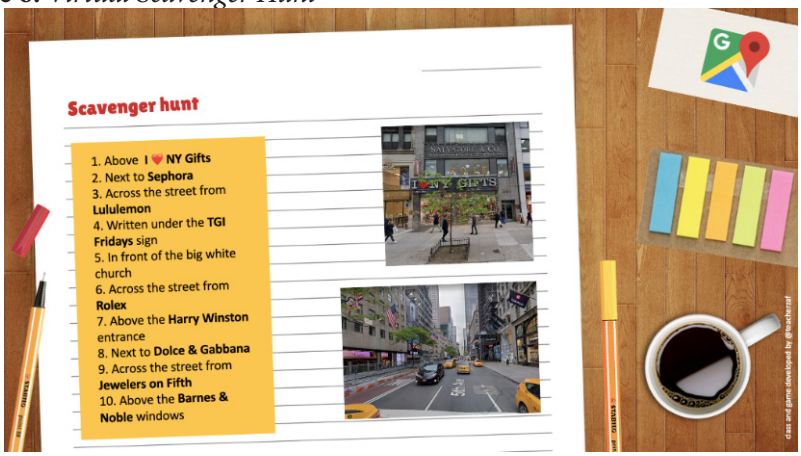
**Figure 5:** *Online Detective*

The advantage of personalizing such games is that teachers can use them repeatedly and adapt the goals and elements of the game according to course content. Undoubtedly, bringing gamification into class in a repurposed manner can help students to develop social and linguistic skills.

### *3.3.2.5 Virtual Scavenger Hunt*

Another interesting tool that can be easily adapted into a class activity is Google Maps, mainly when working with directions. The following image represents Google Maps (Street View) being used for a virtual scavenger hunt (Figure 6).

**Figure 6:** *Virtual Scavenger Hunt*




Like a regular scavenger hunt, students received a list of items to find, but once the hunt was online, they used Google Street View to move around a specific location and find the items from the list.

This version of the game was created to work with prepositions of place and direction with elementary students. The teacher sent them a link to the 5th Avenue (in New York City) and, in groups, they had to explore the street view to look for the items on the list. Students were able to work with prepositions and directions, practice speaking, and improve problem solving skills.

A cause for concern by teachers during the COVID-19 pandemic was the lack of students' engagement. Insterestingly, these games showed that students' attendance and participation increased since the adoption of game-driven classes, both with regular school kids and with higher education adults (with the necessary adaptations). The results showed equally positive outcomes and feedback for both groups in terms of engagement and production.

Having presented and evaluated suggestions for online and face-to-face teaching, and brought contributions from scholars' research on the matter, we conclude our article by addressing our final considerations, pointing out ideas and leaving room for thought for further discussions on the theme.

## 4. Final considerations

In this article, we have attempted to illustrate the evolution of Education 1.0 to 5.0 and relate it to the teaching of EFL with focus on pedagogical implications regarding digital tools today. Applicable examples for developing language skills in the process of teaching/learning of English have been provided for elementary,

high school and college students. They have proven to be effective in improving language learning as well as in managing social emotional skills. Relevant studies made by scholars from different parts of the world supported our premise that digital technologies are helpful allies in nurturing students' participation, interaction, creation, and collaboration in educational contexts.

Concerning the pandemic, two crucial factors have shifted according to Barron *et al.* (2021). Firstly, they say "Pedagogical adaptations have proven to be pivotal as the traditional lecturing in-person models do not translate to a remote learning environment" (Barron *et al.*, 2021). Teachers need to adapt their practices no matter the type of channel used (online and streaming platforms, mobile devices etc) "to keep students engaged as every household has become a classroom – more often than not – without an environment that supports learning" (Barron *et al.*, 2021). The authors state that some countries have been assisting teachers with this. In Sierra Leone, a very interesting initiative that uses the radio – the main remote learning channel available – allowed students to call teachers with questions while helping their families with daily chores.

Secondly, "the pandemic has recalibrated how teachers divide their time between teaching, engaging with students, and administrative tasks". In Brazil, according to a survey conducted by Instituto Península, "83% of teachers did not consider being prepared to teach remotely, 67% were anxious, 38% felt tired, and less than 10% were happy or satisfied. The pandemic has highlighted the need for flexibility and more time for student-teacher interactions online".

To avoid generating burnout among teachers, the Peru's Ministry of Education changed the teaching guidelines to reduce teacher's administrative workload right after the pandemic got worse. The state of Minas Gerais in Brazil developed the mobile application Conexao Escola "to encourage teacher-student interaction during designated time after each class, avoiding a situation in which students contacted teachers through WhatsApp or text message throughout the day". In Uruguay, the government decided to use a familiar digital platform for teachers to report information such as student attendance and grades wihout requesting new information from them (Barron *et al.*, 2021).

Nevertheless, we strongly believe that governments around the globe should provide supporting guidelines to the educational systems in order to guarantee adequate digital access for all students and continuing education for all teachers, even if some adjustments need to be done to meet countries' limitations and realities (like the one in Sierra Leone). The more initiatives that contribute to improve (digital) education at any instructional level are implemented, the better are the chances for students to develop the desirable qualities (responsibility, teamwork, empathy etc.) that can be applied across a variety of jobs and life situations.

To finish, we hope technology offers more quality of life and actions that are relevant to society, premises of Education 5.0. In this sense, technology must be used productively, creating situations that transform the reality of some people and communities, not only in face of the pandemic but on a permanent basis.

## Notes

1. Precisely speaking, young millennials are between 18 and 24 and old millennials, between 25 and 34.
2. The branch of artificial intelligence or AI concerned with giving computers the ability to understand text and spoken words in much the same way human beings do (Chowdhury, 2005).

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