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Digital Collaborative Language Learning and Augmented Reality

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Digital Collaborative Language Learning and Augmented Reality

By

Matthew Paul Taylor

A portfolio submitted in partial fulfillment

of the requirements for the degree

of

MASTER OF SECOND LANGUAGE TEACHING

Approved:

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UTAH STATE UNIVERSITY

Logan, Utah

2022

Dedication page

This work is dedicated to my wife, daughter, and son. It is also dedicated to Professor Koyin

Sung, Professor Abdulkafi Albirini, and Professor Jasmine Chen for being on my committee.

Abstract

Digital Collaborative Language Learning and Augmented Reality

by

Matthew Paul Taylor: Master of Second Language Teaching

Utah State University, 2022

Major Professor: Professor Koyin Sung

Department of World Languages and Cultures

This portfolio is a collection of works written by the author as he was studying in the Masters of Second Language Teaching program at Utah State University. The focus of these works is on technology and its impact on language learning. The first few sections consist of an introduction to the portfolio, a few pages dedicated to the author's philosophy on second language teaching, and details and insights from an observation of a teacher in practice while in the program. The following section comprises the bulk of the portfolio and includes a paper devoted to augmented reality's place in digital language learning. Then the author's professional goals and plans centered around his teaching philosophy will be addressed.

(43 pages)

Acknowledgements

It is with gratitude to my professors and fellow students in the program, my family members,

and my friends new and old that I write this portfolio.

Table of Contents

List of acronyms

ACTFL = American Council on the Teaching of Foreign Languages

AR = Augmented Reality

CALL = Computer Assisted Language Learning

CMC = Computer Mediated Communication

DLI = Dual Language Immersion

DLL = Digital Language Learning

Edtech = Education Technology

EFL = English as a Foreign Language

L2 = Second Language

MALL = Mobile Assisted Language Learning

MSLT = Master in Second Language Teaching

USU = Utah State University

VR = Virtual Reality

Introduction

Over the course of the last two years, from the time I entered the Masters in Second Language Teaching Program at Utah State University, my professional aspirations have changed a great deal. While earning my undergraduate degree, I discovered a love for learning languages, and I also discovered that I enjoyed teaching and mentoring others. I enjoyed making connections with new people through the languages I learned and watching students do the same. With these discoveries in mind, I decided to pursue this program. While in the program, I have taught Elementary school Chinese dual language immersion (DLI) classes but have since left that position and am now working for a Chinese Education Technology (EdTech) company. It can be said that transitioning out of teaching in a classroom setting and into a corporate role at an EdTech company was not part of my plan when I started in the MSLT program, but it has been the right move for me.

Working in Edtech, digital language learning (DLL) has become a vital area of interest for me. DLL involves using technology to enhance L2 learning. Some platforms where this technology is used are Rosetta Stone, Duolingo, and Babbel. What these programs have in common is that they use digital tools and learning models for L2 learners to acquire another language.

Aside from my own work environment, over the last few years I have gained a greater appreciation for the benefits students receive from DLL. Virtual classes, tutoring sessions, and assessments have become quite commonplace, and the stigma that surrounded them has lessened considerably. That is not to say that online learning has completely replaced in-person learning, but rather, it has become an alternate avenue for many to receive education and training or a tool that can be utilized alongside face to face instruction. What is more, people

around the world who may not have had opportunities to learn new skills or languages now are able to through digital learning tools.

One area where DLL can be especially beneficial for L2 learners is learner collaboration. There are modes of DLL that can be applied in L2 programs to benefit learners which will be discussed in greater depth in the pages to come. These modes allow learners to speak with and communicate through messaging and emailing native speakers of the target language from anywhere in the world. Oftentimes, this can be a valuable resource for learners to gain cultural knowledge of the people who speak the language they are learning and linguistic knowledge as they gain needed feedback from native speakers. It is through the MSLT program that I have learned about these technologies, and that is in large part due to the opportunity I have had for most of my classes to be online.

A few of the parts of the MSLT program that have had the greatest impact on me have been observing other language teachers, preparing, and delivering group presentations virtually and in person, and building professional relationships with other students in the program. When I started in the program, I felt timid and lacked confidence in my language teaching abilities, but after being in the program for the last two years, I have gained greater confidence in my abilities and knowledge and feel ready to do my part in improving the DLL experience for virtual learners.

Teaching Philosophy

Introduction

During the last two years, I have gone from a very vague idea of what role I see myself playing in education to a clearer vision of what I see myself doing. As mentioned before, I began teaching at a DLI school two years ago and, through that experience learned that there are many difficulties faced by second language (L2) instructors including difficulty finding and accessing appropriate resources for students and difficulty encouraging students to value their opportunity both inside and outside of the classroom to learn the target language. With these lessons fresh in my mind, I am now working in sales and business development for an education technology company with a Chinese learning platform. As a classroom teacher, I enjoyed teaching my students and seeing them progress, but I wondered what they were learning outside of the classroom and whether technology was having a positive or negative influence on their L2 learning. Now, I can use my teaching background to assist parents of students learning Mandarin Chinese by educating them about resources my company provides such as online tutoring where students can continue to learn the language outside of an L2 classroom and at the same time, use technology in a positive way. It is my belief that platforms like the one my company has developed have much to contribute to L2 learning. One of the most important parts of such platforms to me is digital collaboration, and I will expound on this and give some examples of modes of digital collaboration in the pages to come (Blyth, 2018). I aim to use the knowledge I have gained in this program coupled with my growing knowledge of education technology to benefit more language learners than I could have in a brick and mortar classroom.

Teaching Environment

As stated previously, my role is now in sales and business development for an Edtech company with a Chinese education platform. In the future, I hope to continue in such a company where I can assist stakeholders in education outside of the classroom. I see myself working remotely as I am now, communicating with education and business stakeholders alike daily to solve problems in education. In fact, I am working on solving some of the problems with teaching literacy in Chinese DLI schools with my company currently. This involves daily communication with parents of children in DLI schools, teachers in DLI schools, and members of my team at the company I work for. Recently, we have developed a platform for Mandarin Chinese literacy. This resource is being implemented in a few dozen Chinese DLI classrooms in the United States. When I was a Chinese DLI teacher myself, I was not sure how to motivate my students to read outside of the classroom, but the app we have developed is fun and interactive, and since its launch it has motivated thousands of children to read outside of their Chinese DLI classrooms.

Teaching Philosophy Statement

I will first explain the philosophy I have towards teaching and then I will give examples of DLL technologies that support them. I believe that there are certain things L2 learners need to learn a language. It is the responsibility of educators to provide them with the resources and opportunities necessary for language acquisition. To me, language learning centers on meeting the learning needs of L2 students. Educators may have a hand in meeting these needs, but learners themselves do also. There are five components of my teaching philosophy which will be detailed in the following paragraphs. Following these five components, I will describe some of the most well-known examples of DLL such as digital language apps and tools including, Duolingo and Pleco (Li & Lan, 2022). While using these apps, I have found that they offer

different things to L2 learners. They also utilize different learning models and resources to assist learners in language acquisition. As I have learned about second language learning theories and compared the various DLL technologies currently available, I have begun to see the vital role that technology plays in L2 learning, and what I can do to participate in the work being done to make DLL technologies more and more effective for L2 learning and acquisition. My teaching philosophy focuses on using collaboration and co-construction to teach form, providing opportunities for classroom communication, connecting what students learn in the classroom with life outside of the classroom through immersive L2 learning, using gamification to make learning fun and engaging, and applying extrinsic motivators to increase both individual and interpersonal motivation. I will also provide examples of how applying DLL technologies can be utilized in L2 classrooms to accomplish the components of my teaching philosophy.

I believe that utilizing collaboration and co-construction to teach form is beneficial for L2 learners. An effective way to do this is using stories to illustrate grammatical form. The PACE model of learning grammar as taught by Borg, (1998) is an effective way to do this for L2 learners. The "P" stands for presentation of meaning in language. In the presentation portion of teaching grammar, it is important to use visual and non-verbal tools to help students start to understand what they are learning. The presentation portion focuses on introducing the grammar lesson to the students. Attention is the second step in the PACE model. The main idea of this step is to gain the students' full focus on the grammatical form being taught, emphasizing key words and contextual clues can help to accomplish this. Co-constructing an explanation is the third step in the PACE model. This step involves collaborating with students and students collaborating with each other to use the grammatical form being taught in context. This is the step that takes

the students from understanding the grammatical form to using it correctly. The final step of the PACE model is extension. Extension activities allow students to implement the grammatical form they learned from the lesson further as they continue to learn. An example of this would be if a teacher told a story to a class and emphasized interjections the characters used in the story, then asked students to create their own stories using those interjections in appropriate contexts. All aspects of the PACE model encourage learners to be active thinkers and hypothesizers as they collaborate. This model allows students to engage in cognitively challenging activities that encourage them to negotiate and create meaning by deriving meaning from context. (Borg, 1998) This model gives learners opportunities to communicate about coherent texts and solves problems collaboratively.

Phone apps such as the two I mentioned earlier, Duolingo and Pleco can make learning vocabulary and grammar easier and more convenient for L2 learners. These and other flashcard apps can be used in classrooms as well to help students learn. The Pleco app has hundreds of news articles in Mandarin Chinese that learners can use for language study. An instructor could use these articles for a grammar lesson and implement the PACE model while doing so. In the presentation portion of the lesson, the instructor could use visual aides or videos that are related to the topic of the article in their instruction. For the attention portion of the lesson, they can then emphasize key terms and new vocabulary to the learners. To use co-construction in a lesson with this digital tool, the instructor can assign students to pairs and request that they read a certain passage in the article, then take the grammar principle in that passage and apply it in conversation with each other. Finally, they can finish the lesson with an extension activity requiring learners to write their own sentences using the grammatical concept taught in the lesson.

Another thing I have realized is essential to L2 learning is having consistent and regular classroom communication in the L2. Classroom communication is the sharing of information in a classroom between instructors and students, and students with each other. It involves using the target language that is being taught in the classroom to accomplish a goal such as completing an assignment or having a discussion (Ellis, 2005). An example would be that students need to describe what they are doing over the weekend to each other in the target language. To accomplish this task, they must first understand the vocabulary and grammar related to the tasks they are doing over the weekend. After that, they can use that knowledge to communicate the information.

Apps and programs like Hellotalk can be useful for expanding L2 communication outside of the classroom as they provide many opportunities for learners to message other learners in app, correct each other's language use, and find private tutors to practice with (Nushi & Makiabadi, 2018). Language learners can use these apps independently to connect with other speakers of the target language or teachers can use them in a lesson as a tool to encourage students to speak with or exchange typed messages with native speakers of the target language. Telecollaborative language exchanges are a similar resource to such apps and often involve entire classes of L2 learners. These exchanges are typically organized by educators and can be carried out in various ways such as through a video-conferencing tool or an asynchronous video-sharing website. (Luo & Yang, 2018). Regardless of whether it is a one-on-one personal exchange through an app independent of an L2 classroom or a whole class telecollaborative exchange, technology can provide both asynchronous and synchronous ways for L2 learners to communicate regardless of whether they have a speaker of the target language near them

(Mebratu, 2015). For this reason, I see the technologies mentioned as effective resources to provide L2 learners with opportunities to speak and interact in the target language.

L2 learners also benefit from immersive learning. This can include connecting the vocabulary, grammar, and cultural lessons they learn in the classroom to situations, experiences, and objects outside of the classroom. Immersive classrooms where the instructor only speaks in the target language and students are required to only respond in the target language have increased in popularity, but digital immersive L2 learning is also an area that is seeing growth (Blyth, 2018). Augmented reality (AR) is an immersive technology that can be used in both digital classrooms and physical ones to aid students in making connections between the concepts they learn and life outside of an L2 classroom. AR can create a more immersive L2 learning environment for learners. A potential use of this technology would be for educators to create AR games using software such as ARIS, a software created by the University of Wisconsin-Madison (Phon, et al., 2014). This software does not require any knowledge of computer programming. Using it, educators can design location-based AR games for their learners.

L2 learners need to have fun and be challenged through playing games while they learn. Gamification can be both fun and challenging to learners through completing tasks that increase in difficulty and earning rewards (Chik, 2014). Learning games can be helpful for learners of many ages. Games can also be used to teach a wide variety of subjects and lessons ranging from specific vocabulary terms organized by topic to advanced grammatical concepts. They can also be played with or without digital tools and can be played in single-player or multiplayer. The variety of games and ways of playing them can allow L2 instructors to cater them to the individual students they teach. The benefits of gamification on digital L2 learning are also not

only limited to the AR games I mentioned earlier. Duolingo utilizes gamification extensively. This app has quickly become one of the most popular and widely used DLL technologies of today, and that can partially be attributed to the way it feels like a game to learners as they use it.

Also important to L2 learning is learner motivation which can be influenced by extrinsic motivators such as points or rewards that students earn through their own efforts (Hennebry & Gao, 2018). There are two types of learner motivation which, when utilized by L2 instructors, have the potential to improve L2 learning outcomes. These are individual and interpersonal motivation. The first is fueled by four emotions which are challenge, curiosity, control, and fantasy. The second is fueled by three other emotions which are cooperation, competence, and recognition (Malone & Lepper, 1987). When L2 instructors make the emotions their lessons instigate in their learners a consideration during their lesson planning, they may see increased motivation in their students. Some of the DLL technologies already mentioned can improve learner motivation. Learning games may be built around challenges linked to rewards. This is the case with the Chinese literacy platform my company has developed. When learners finish reading books in the app, they can earn points and use them to read more books and accumulate stickers. This system of extrinsic motivation uses points and stickers as rewards to motivate students to read more books.

Conclusion

In summary, five components of my teaching philosophy are: the PACE model of learning vocabulary and grammar, classroom communication, immersive learning, gamification, and the use of extrinsic motivators. I believe that these five components can improve L2 learning outcomes.

There are many DLL apps and tools available for L2 learners of almost any language at any level. These resources have many functions and benefits for learners. My goal now and in the future is to utilize my L2 teaching background and continue to develop my knowledge of education technology to work with stakeholders in education and industry in the pursuit of helping L2 learners utilize DLL technologies and gain proficiency in their target language.

Class Observation

Observation Context

In fall of 2021, I observed a third grade Chinese dual language immersion teacher in their classroom. The lesson was an hour in length and the class had about 25 students. The lesson I observed focused on storytelling and the curriculum for the lesson was a short story that the instructor used to teach the students. The short story being used was developed with ACTFL standards in mind and contained vocabulary terms and grammar concepts that built off what the students had previously learned in first and second grade of the DLI program.

The story the students read was about a father asking his kids to help him around the house. All of them declined his invitations for most of the day. At the end of the day (and the end of the story) he asked who could help him eat ice cream and all his kids were willing to help with that. A couple of the concepts taught in this story are how to extend an invitation and how to politely reject an invitation. The students were able to discuss not only the content of the story, but what the actions of the father and children show about them, and why they would say what they said in the story or act the way they acted.

As third graders in the Chinese DLI program, these learners had been learning Mandarin, Chinese for over two years when I observed their class. They were expected to be at a novice-mid level to novice-high level meaning that they would be able to carry out basic conversations in the language and read and write roughly 50 to 100 Chinese characters. That said, in the lesson I observed, almost all the students were using their Chinese closer to a novice-high level. The instructor had clearly given them many opportunities to practice speaking Mandarin in the classroom. What's more, the class was very on-task and focused despite their young age.

Instructional Procedure

The instructor's teaching approach focused on the use of reading, writing, speaking, and listening together rather than separately. For this lesson that required students to transition from one short activity to the next to give them opportunities to use each skill during the lesson. They first looked at the pictures of the story without reading it and predicted vocally to each other what it would be about. The next part required them to write down their own story based off the pictures using familiar sentence patterns. The third part of the exercise was for the students to read the story together taking turns. Last of all, after reading the story they had to summarize together in pairs the events therein.

Throughout the lesson, the instructor encouraged students to give varying vocal responses. Their teaching style was fast paced and energetic, yet the students matched the teacher's energy seamlessly. There were also various incentives for the learners to be engaged and on task in the lesson including opportunities to help guide the class in reading certain pages, class points given to groups of students who did particularly well, and vocal praise by name. The teacher reminded me of a choral conductor as they directed the students, and they followed suit.

Another important observation I made about the instructor was that they moved around the room a lot. For educators who are as engaging and focused as this teacher was, it can certainly be easier to stop and take a rest while students are working in pairs or groups. This teacher did not do that. They took notice of what students were talking about and provided individual feedback and praise to as many students as possible while they were not in front doing whole group instruction. The transitions were also well thought out and well-practiced, and transition time from one stage of the lesson to the next was brief.

The classroom was organized with desks grouped together in fours and ample room in between them for the teacher to walk around. The distance between groups of four also created an environment where students would not easily be distracted by other groups in the classroom but would rather be inclined to focus on the conversation in their own groups. The students turned their chairs to fair the front whenever whole group instruction was used and this routine was well practiced and quick. There were other areas of the classroom with resources students could use at different parts of the lesson for example, a wall filled with characters students could reference when writing sentences, learning objectives and class rules on the white board at the front of the classroom, and an entire bookshelf of grade appropriate books that students could read for fun aside from the books they read that were part of the curriculum. Students understand when appropriate times to pick up a book from the bookshelf mentioned or walk over to the wall with characters for them to reference. This instructor had prepared well for the daily tasks the students would take part in and had trained them to follow the rules and procedures they set out.

Evaluation

As has already likely been inferred, I was impressed with the lesson I observed. There were a few things that caught my eye. The classroom organization surely required planning and time setting up prior to students even arriving for class on the first day of the school year. Student rules and procedures were well practiced and explained so that every single student understood what was expected of them in the classroom. The teacher was engaged and involved during the entirety of the lesson, including when students were working groups. As for the curriculum, I have more to say about the approach the teacher took in the classroom.

This approach included having students learn and practice speaking, listening, reading, and writing during their lesson. This allowed learners to develop different competencies in the target language and shows students the importance of learning all aspects of the language. This is especially relevant to Mandarin as, from my personal experience, it is easy to focus on speaking the language and avoid learning to read Chinese characters. Making the connection between spoken Mandarin and written Mandarin has been a vital part of my own learning, and the teaching approach utilized by the instructor is an effective way to help students make this connection repeatedly.

Reflection

For this lesson, the teacher had well-practiced routines in place which allowed students to understand when a choral response was expected and required from them. In my own experience, establishing this kind of routine is difficult, and is a testament to the teacher's classroom management skill. If I were teaching the class, I would require students to raise hands to chime in during whole group instruction and couple that with using more group response strategies during instruction and accepting fewer individual responses. Although the teacher in this case handled interruptions tactfully, in my own personal experience teaching, only accepting individual comments from students with raised hands during whole group instruction has shown to be an effective way of keeping young students on task and preventing outbursts. One reason I also would utilize more whole group response strategies in the classroom is that this is a way to be sure every student is paying attention and participating, whereas with individual comments, young learners who are not the one commenting may become distracted and miss out on instruction. As mentioned, this teacher had taught their students well so that

they were able to understand when it was their turn to speak and have the maturity to give attention to other students as they made individual comments to the class.

I learned from this observation that there is a lot more that goes into having an engaged and interactive lesson than being energetic and talking fast. It would not surprise me if the instructor spent hours preparing for the lesson, and even aside from that time, the time spent creating and cultivating an open and interesting learning environment could never be done overnight. Although I am not sure how long this teacher has been instructing young learners, the methods they used to teach show years of practice and learning.

I believe that understanding effective teaching strategies is important for many professionals outside of the classroom as well inside the classroom. In my current position, I routinely work with parents of children learning Mandarin, Chinese. It is my responsibility to help them access the learning resources they need for their children which my company provides. Part of this includes individual lessons for students and understanding what sort of teaching methods would benefit their children helps me to recommend the most appropriate learning materials, courses, and tutors to meet their needs.

The teacher I observed used a variety of effective instructional strategies. These included, being engaging, and interacting with the student, giving ample amounts of praise and constructive feedback, and keeping a good pace during the lesson. From what I was able to observe of this instructor's lesson, they made meeting their learner's needs a priority, and used a variety of instructional strategies to accomplish this task.

Benefits of Using Augmented Reality in Combination with Digital Language learning

Collaborative Activities

Introduction

The following paper will show how using augmented reality (AR) in combination with other digital second language learning forms have potential to improve collaborative exchanges between learners. This topic was chosen as it relates to my current professional role, assisting language learners in utilizing online Chinese curriculum and synchronous lessons. Over the years there has been much debate as to the benefits and drawbacks of digital learning and integration of virtual reality (VR) and AR in education. In the sections to come, the benefits and drawbacks of using augmented reality in language exchanges will be addressed.

Over the last few decades, immersive L2 learning has shown to be beneficial for learners, but one thing that remains a difficulty for many learners is that once they leave the classroom, they have no one to practice the language with. This results from learners' not having other L2 speakers near them. Yet, this is where digital language learning (DLL) creates great opportunities for those who are willing to put in the effort to utilize it. DLL provides valuable opportunities for L2 learning. It is the use of technological tools and platforms to enhance L2 learning (Li & Lan, 2022). DLL platforms and technologies include, for example, Rosetta Stone, Duolingo, and Babbel. These and many other similar programs for DLL are often used for collaborative exchanges with learners of the target language and native speakers living in another part of the world. Two technologies that are of particular interest to me as pertaining to L2 learning are VR and AR. These two technologies have shown to be effective for immersive and engaging L2 learning (Phon & Ali, 2014). VR refers to computer generated environments that are fully immersive for users. Usually, VR headsets or glasses are used to allow the user to

view images that are not in their physical world. AR is less immersive and puts greater focus on bringing the virtual into the physical world through technologies such as a camera filter or certain types of 3D glasses. Milgram and associates, (1994) wrote about a continuum of reality or the real environment, AR, augmented VR, and VR. AR is shown to be between the real environment and VR in this continuum. This means that part of AR is virtual and part of it is physical.

The use of AR in collaborative language learning is still an area where more research is needed (Punar Özçelik, et al., 2022). That said, there are conclusions and statistics surrounding this topic which show the potential effectiveness of using AR in this way. In the following paragraphs, evidence will be shown to explain the benefits of using this approach to language learning. The structure of the paper consists of evidence and statistics shown from previous research, observations made of in-person and digital L2 learning environments, and my own personal experience as a teacher, and learner in both in-person and digital contexts. After showing the supporting data, conclusions and applications will then follow.

In recent years, VR and AR have gained popularity, and two types of AR programs have begun to see increased popularity. These, more prominent types of AR programs are location-based, and vision-based. Location based AR programs use global positioning system (GPS) to use real data about distance and location features combined with fictional elements for learning or for a game. Vision based AR programs often incorporate a QR code or camera filter that, when used, can allow users to see fictional images along with real ones. That said, the research on both types of AR programs is still in its infancy, and research into AR's usefulness in L2 learning is particularly lacking (Punar Özçelik, et al., 2022).

Despite this lack of research, advancements into AR technology have expanded more quickly than many thought possible, with the widespread success of games like Pokémon Go, showing the demand from users and excitement in this area (Punar Özçelik, et al., 2022). Millions of learners are also currently using games to learn the L2 through Duolingo. As mentioned by Li and Lan, (2022) in their review of DLL, this platform has become a well-known L2 learning resource for learners, and this is at least in part due to the focus of the app on making L2 learning feel like a game. With this understanding that L2 learners enjoy using gamified software to learn, one can infer that AR L2 learning games also have potential to be enjoyable and beneficial for learners. Future research into this area will give more insights into how AR benefits all aspects of language learning, including writing, reading, speaking, and listening. For this paper however, the focus will be on the perceived benefits that AR can have on collaborative exchanges using telecollaborative communication, CMC, and digital storytelling. All of which are examples of modes of DLL and CALL.

To understand how AR is beneficial to the modes of DLL, it is necessary to first understand more about DLL, and to understand what Computer assisted language learning (CALL) is. Over the past thirty years, CALL has been the dominant force of online language learning. It has evolved considerably during that time with programs such as free courses online, and CMC. One of the benefits of CALL is allowing students to learn languages on their own, without the need for an instructor to be present. DLL is a more recent concept, and it can be said that it has evolved from CALL. Many of the most well-known language learning apps and programs today are examples of DLL. As mentioned earlier, these include Duolingo, Babbel, and Rosetta Stone (Li & Lan, 2022). The widespread use of these apps show the influence DLL is having over L2 learning.

Previous Studies on AR and L2 learning

In the following paragraphs a review of some of the major studies and their findings about AR in L2 learning from the past five years will be discussed. This review may show why further research into this area is necessary, and the potential positive results AR can bring to DLL collaborative exchanges. In their review of AR in L2 learning, Punar Özçelik, Eksi, & Baturay, (2022) mentioned five of the most prominent AR technologies used in education. These are AR books, games, discovery based learning, and object modeling. AR books can show 3D content with the use of an accompanying App. Yuen, Yaoyuneyong, Gallayanee, & Johnson, (2011) conducted a study on these technologies which showed them as the most significant AR technologies in use today. AR games use the above-mentioned location-based or vision-based modes of AR to either use the users surrounding such as playing a GPS based game or using a tool such as 3D glasses to allow users to see things that are not real for the sake of the game. Godwin-Jones, (2016) has written about the benefits these AR technologies have on learner motivation. Discovery based learning and object modeling are rather learner-directed and involve exploratory options and the use of digital objects to enrich learner understanding. A main conclusion from this review was that there were only 17 research studies pertaining to AR in language education from the years 2017 to 2021 in the journals the authors noted for this review. From these studies, the most popular topics researched were learner motivation and learner attainment. Results from the studies showed that both learner motivation and learner attainment improved during various studies following learners using AR for L2 learning.

The authors mentioned specifically that there was a lack of research in implementing AR in L2 classrooms. This shows the need to conduct more research in this area and to conduct more studies in more locations around the world. Current limitations to the research are that research

of AR for L2 learning is still a very new area, and it has not been implemented in many L2 learning programs and institutions. More research is needed because discovering and understanding best practices for the use of these technologies in L2 learning will have positive effects on learner attainment. Yet, more research into the effects of AR when used with other forms of DLL is an area with great potential, worthy of more research. In a graph showing the distribution of research studies used in their review of empirical studies on AR in L2 learning, Punar Özçelik and associates noted that from the years of 2017 to 2021, distribution of studies on AR in L2 learning is lacking. Year by year there was one study noted in their review from 2017, one from 2018, four from 2019, eight from 2020, and three from 2021.

As can be understood from the numbers of studies observed on AR in L2 learning during these years, they are lacking in numbers and although there have been more in the last few years, there are still few being conducted. There are potential benefits of using AR to enhance DLL and the studies Punar Özçelik and associates (2022) wrote about in their review show promising results in this area. Yet, there is little research on the use of AR in instructional L2 learning settings as this area of AR in L2 learning is still in its infancy. Nevertheless, as will be shown in the coming paragraphs, the potential applications and impacts of AR on digital learning, especially for educators, are substantial.

The Application of and Future of AR in DLL

AR is already undergoing great improvements and picking up pace. With games like Pokémon Go, individuals can go to different real life locations to catch Pokémon and have their Pokémon monsters battle each other in the game. Location-based games and applications like this can be largely beneficial to language learning as they can be very immersive and engaging for learners. They can also be useful as a method to give students a task and have them

collaborate to accomplish it. I remember when I was twelve years old, my class split into different groups and went geocaching in the park near my school. With AR, this can be done completely digitally. For example, nowadays, teachers like my sixth grade teacher, can use resources such as ARIS to create their own location-based AR games using a location around them and having learners look for digital items in a real-life location (Phon, et al., 2014). Technology like this can be implemented by an L2 instructor in a classroom setting even if that instructor lacks technical knowledge because the program does not require technical programming ability to use it.

Another application of AR in L2 learning is the use of QR codes. This can be especially useful for distance collaboration exchanges as learners can send QR codes to each other which will then pull up images and content that can be seen through a phone camera along with the students real surroundings. This can lead to a more immersive exchange for students as they can share 3D animations that express themselves and help them connect with the other student they are communicating with in another location. An instructor can use 3D animations like these to provide a more immersive experience for learners. For example, perhaps the instructor is teaching a lesson on clothing related vocabulary. If the students can use a QR code to view various clothing articles such as jackets or hats on each other, they can have a memorable and engaging experience learning these vocabulary terms.

The ability to pull up a phone camera and put it in front of an object, and then be told what that object is in the target language is a very convenient tool for L2 learning, and as mentioned previously, if this technology is used in video communication, it can be very beneficial to digital L2 learning exchanges, allowing learners to look up words seamlessly

without interrupting the flow of conversations. That said, translation tools can be effective, but it is the responsibility of educators to teach students their appropriate use.

All the AR technologies mentioned can be largely beneficial to DLL learning exchanges as learners use them to assist in their learning of speaking, listening, reading, and writing. They can also provide greater opportunities for the learners in the exchange to connect with each other and improve their cultural understanding of each other. Applying these AR technologies in telecollaborative exchanges, CMC, digital storytelling, and open online courses is likely to increase their effectiveness.

It is necessary for L2 educators to begin using AR technologies in their classes now, for these technologies are changing at an increasing pace, and understanding how they can be used for DLL now will allow them to better utilize the technologies that are still to come. Advances such as providing live AR simulations, AR books, games, and live translation technology are already being used and continuing to develop. These technologies have the potential to be very beneficial for L2 learners during collaborative learning exchanges and will need to be utilized by educators for the L2 learners' sake.

Four Modes of DLL:

There are four specific modes of digital L2 learning that have especially shown to be of benefit to learners. These elements of digital L2 learning are telecollaborative dialogues, computer mediated communication, digital storytelling, and open source online courses. Along with explanations of what these modes entail, examples of AR technologies and their utilization with these modes of DLL will also be explored. The AR technologies which will be mentioned are location-based AR games, AR QR codes, virtual backgrounds, AR translation and

identification tools. These technologies will be explained and the benefits they add to DLL will be explored.

Telecollaborative Dialogue

Telecollaborative language exchanges typically involve two classes of L2 students who use digital technology to communicate and practice speaking the target language together (Luo & Yang, 2018). Usually, each class will be learning the other's first language as a second language, but there are also such exchanges between classes who are both learning the same language and at around the same level. One of the greatest challenges with these exchanges is navigating the cultural differences between the two classes. Yet, this can also be a great benefit to these exchanges, as students often report having gained more intercultural knowledge and understanding from participating in the collaborative exchange.

I have attempted to organize a telecollaborative exchange and I have seen other educators successfully use them in their classroom. The exchange I attempted to orchestrate myself involved my class of Chinese students in an elementary school and another class of elementary school students in another Chinese program, living in another state. This was, however, not a successful exchange. The primary reason for my failure to have a successful telecollaborative exchange was the large workload necessary to make it happen coupled with the decision to conduct the exchange toward the end of the school year. My students were also very young and had limited digital proficiency and I struggled to find the time to orchestrate the exchange effectively.

At the time of planning the exchange, I worried that the exchange would take up too much time and be difficult to set up. That said, with proper planning done ahead of time, I can see how such an exchange can be effectively implemented in an L2 classroom. One small

change would be, instead of attempting to conduct an exchange toward the end of a semester or school year, beginning planning the exchange before the school year or semester begins would give an instructor more time to prepare and spread out the workload to make it more manageable.

Using an AR game that is already established and play tested can also take away some of the planning and preparation making it more feasible for instructors to carry out such activities and to carry them out repeatedly. I believe that using AR this way in such activities can have a few positive results. One positive result is the increased motivation for students to communicate with their exchange partners outside of the classroom. If an AR game is used for this activity, students will be likely to enjoy playing it and may not even notice that they are learning when they play. And the last potential benefit would be greater learner collaboration which is important to L2 learning (Phom, Ali, & Halim, 2014). I have seen firsthand how young learners can be eager to collaborate when playing a game by observing former students and listening to conversations about games they played together. Drawing from these observations, I believe that developing learner motivation and encouraging collaboration through an AR game will improve L2 learning.

There are also potential difficulties that may arise with setting up a telecollaborative activity, and it is important that educators are aware of them before initiating such an activity. Because a student's economic and financial situations may vary, not every student may have access to the internet or a computer at home. This can make it very difficult for them to access any homework that requires such technology outside of the classroom. If this is a concern for an educator, I advise them to consult with the administration at their learning institution as, from personal experience, typically there is funding available at many such institutions for situations

such as these. Also, as noted previously, cultural differences between classes may cause misunderstandings or arguments which can sour the otherwise positive experience of such an activity. It is wise for instructors to address both potential problems proactively before the activity begins.

Despite limitations, AR can lead L2 learners to be more focused on learning together and working together to accomplish a goal either through working collaboratively in a game or using engaging technology such as location-based AR technologies to accomplish a task (Luo & Yang, 2018). Telecollaborative learning exchanges would be improved from such technologies as L2 learners increase in learner and engagement and collaboration between students.

Aside from whole class telecollaborative exchanges, individual learners can also make use of telecollaborative technologies. HelloTalk is a language exchange platform that can be helpful for this reason (Nushi & Makiabadi, 2018). When users use this platform, they can select which languages they want to learn and which languages they can help others learn. Then, they are paired with L2 learners who they can benefit from, and can in-turn, benefit from them. This platform can also be utilized by instructors as a resource for collaborative exchanges, especially if the instructor decided to take a less hands-on approach and leave the specifics of who they connect with to the students.

Looking back at my experience attempting to set up a telecollaborative activity, I can see how using an AR game for the activity, and having students use that as part of the exchange, could have increased their motivation to learn and desire to participate. As mentioned earlier, previous studies on AR in L2 learning have shown that that it can improve learner motivation (Punar Özçelik, et al., 2022). Developing such motivations in students can be challenging, but AR games are a resource that can lessen the difficulty of this task for L2 educators.

Computer Mediated Communication and Collaborative Dialogue

CMC involves students using the internet to communicate digitally. By this definition, telecollaborative dialogues fall under CMC's as well (Luo & Yang, 2018). There was a study conducted by Zeng (2017) which involved two groups of students learning English as a second language at a Chinese university. One of these groups was taught during the study in a face to face (F2F) learning environment. The other group was taught in a CMC learning environment. Both students learned the same English curriculum. Language related episodes (LRE's) were observed during the study, meaning that the number of times students self-corrected or addressed the grammar and syntax of the language while interacting with each other was counted. The results of the study showed that the group that learned in a CMC environment had more LRE's than the F2F group. This group had a greater focus on form and using the proper grammar and rules of the language.

Using AR has potential to improve the results of both CMC and F2F L2 learning. This is partially because of the convenience that such technology allows for. For example, there are now AR programs where one can take a picture of an object and immediately see the vocabulary for that object in the target language. This kind of technology could be used in person while talking about an object to find the word to describe it, but it could also be used on a video call using CMC. This seems like a useful technology for a collaborative activity. Perhaps online learners can have pictures or items behind them during a video call and they would be tasked with using the AR technology to find the vocabulary words for those items or pictures. To make this more interesting to learners, they could keep track of points or race.

Other studies have shown that AR is useful for improving L2 literacy proficiency (Yeh & Tseng, 2020), but it can be observed that it can also be useful for listening and speaking. This is

because, as with examples of being able to quickly look up objects during a conversation, it gives the learner something to talk about. If they know the name for the food they want in the target language, or the translation of the name of a song they want to listen to, or just the words of objects around them, they can use this knowledge to their benefit when interacting with others whether in-person, or digitally. The use of this technology in real time means that L2 learners may be able to interact more in the moment vocally rather than looking up words later after the conversation.

An L2 instructor may teach learners to use an AR application which shows the L2 words for objects they use in conversation and have this application accessible to them during class roleplays whether digital or physical. They can then bring props into the classroom or use pictures that students can utilize as they converse in the L2. If a student comes across an object, they do not know the L2 word for such as chair, they can pause the roleplay and use an AR application on their phone to view the object or a picture of the object provided by the instructor for the roleplay and see the word for the object in the L2. This could be done more quickly and efficiently than looking up the word in a dictionary so long as the phone application was prepared ahead of time, and the images of some of the objects students may need to look up have already been prepared by the instructor.

In my own experience, I can think of many times when this AR technology would have been useful, whether it was when I was video chatting with someone in the target language and trying to point to something behind them, but not knowing the word for it, or ordering off a menu I could not read with pictures and just saying, "I want that." Using AR can allow those moments of confusion to become key learning moments for an L2 learner and allow them to navigate otherwise difficult interactions in the L2.

Likewise, AR technologies can be utilized in a digital L2 classroom during a roleplay activity. One example of a roleplay where this could be used would be addressing someone behind a counter in different contexts and making a request or a purchase. The AR technology here can provide a virtual background to match the setting of the roleplay whether that be ordering popcorn at a movie theatre or making a cash deposit at a bank.

This type of roleplay could be carried out with students in a classroom carrying out two types of roles. The first role would be customers at a movie theatre. The second role would be the worker behind the counter selling movie tickets and popcorn and other snacks. Two AR tools could be utilized in this roleplay. The first would be a QR code which allows the two learners to view movie tickets and snack items such as popcorn digitally as though they were there. The second would be a camera-based AR translation tool which would show the learners the word for a specific snack or for a movie ticket when they take a picture of the object. There are different scenarios where either AR tool could be used to add to this sort of roleplaying scenario. Either one could be used without the learners being in-person through CMC such as the use of virtual meeting software.

Digital Storytelling

Digital storytelling involves using multimedia tools to illustrate a story. This is often done through video, and can include images, music, and text to illustrate a point or teach a concept. This is an effective way for students to express creativity and learner autonomy while learning (Moradi & Chen, 2019). AR can be especially beneficial to digital storytelling because of the potential to make a story feel more real and meaningful to those telling the story and those listening to it. With AR, it is possible to use imagery and have components of the story literally seem to come to life as they can appear to be there with you as you tell the story. In

their writings on digital storytelling, Moradi and Chen (2019) mentioned that this can also lead to greater engagement and attention when using this mode of digital L2 learning.

One note about digital storytelling from previous empirical studies on the subject is that presentations and group collaboration are highly beneficial for learners (Thang & Mahmud, 2015). Other benefits of digital storytelling included increased curiosity, willingness to explore, critical thinking skills, and higher learner motivation (Yang & Wu, 2012). I believe that learners need to be engaged, motivated, and enjoy a creative learning environment. Seeing a character from a book pop out, looking through glasses that make the world look a different color, or using a camera filter to have something interesting appear in an image can engage learners and increase their curiosity. It stands to reason that this would only be intensified when telling a digital story. One of the greatest benefits of such stories is the potential for them to touch learners emotionally. This can be especially powerful for children as they imagine what the character in the story is feeling and learn to empathize.

One way to make digital storytelling more engaging and interesting to learners is using a virtual background. If I assigned students to read short stories together in the Chinese virtually using a virtual meeting software, one way to make the story more immersive for them would be to preselect digital backgrounds for them to use which would help carry the atmosphere of the story. For example, if I had students in groups of three on a digital meeting read a story about a family at the beach, I could preselect backgrounds of the beach for them. Or, I could have them find their own virtual backgrounds of the beach to use during the lesson. This is a minor detail of an L2 lesson, but with multiple minor details like this one, the digital story that is told in a virtual lesson can be more compelling and interesting to learners.

Open Source Online Courses

Many learners may not have opportunities to engage in language exchanges with other learners or to attend university or private courses. What they do have is open source online courses, where they can learn a language for a very low price or for no cost at all. These types of courses are especially valuable when learners may have limited access to other speakers of the target language and/or are looking for more learning opportunities. Although these courses are recorded and there may not be an instructor available to contact when learners have a question about the course, there are often options for learners to chat with each other and engage with one another virtually as they learn together. Over the last decade, these courses have grown in number, but also in quality, and there has been research into their effectiveness. Most of this research has shown that these courses do require a great deal of self-motivation from learners, while also providing positive learning outcomes for those who stick to the courses they begin and finish them through to the end (Fang, Chang, & Huang, 2019). The demand for online courses has also increased along with their number and have allowed for many learners who did not have access to in-person courses to learn online.

A study in Malaysia by Krishnan, Ching, Ramalingam, Maruthai, Kandasamy, Mello, Munian, & Ling, (2020) also showed that students are more likely to utilize online language resources than they were before Covid-19, and social distancing and quarantines have especially fueled this desire for students to access learning materials online. One result of the study was that students need guidance from instructors to know which online L2 learning resources are more effective, and which are not.

AR can also be beneficial to online language courses as it can allow for such programs to be more immersive, engaging, and interactive for learners (Punar Özçelik, et al., 2022). The biggest issue with free online courses is lower rates of completion, but if learners are engaged,

they will have a lower likelihood of giving up on the courses prematurely. For this reason, using AR would be very beneficial to these courses. Some practical examples of AR technology that could benefit an online course would be location based AR resources that could be built into the curriculum of the course and encourage learners to visit locations in real life where the AR technology will teach them about the vocabulary for the places they visit, and QR codes that can allow learners to view information and images that are part of the curriculum as if they are in real life (Yuan, et al., 2011). Either of these technical applications have the potential to increase learner engagement and participation in online courses without necessarily having the instructor or other learners present. As an educator, I have created coursework for students and taken online courses myself, and I see that the need for making learning material that is engaging and interactive is there yet can be especially challenging when teaching online lessons. AR technologies such as those mentioned have the potential to be useful to L2 instructors who desire to improve the engagement and participation of learners. Using digital QR codes to bring images to life and support an immersive learning experience and designing location-based AR games are two of the ways I can see AR being utilized in DLL.

An important note about these technologies is that they have the potential to benefit learners in different ways. For example, if I used QR codes in an L2 classroom and allowed learners to use this tool to view objects through a camera lens which are not there, this can bring greater context to my lesson as students digitally see the objects in front of them as if they are physically there. This way, they could potentially learn about weather related vocabulary by seeing rain falling from the ceiling or learn different names of animals by seeing the animal in the classroom. On the other hand, a location based AR game could allow learners to have a goal to accomplish such as finding locations on a map and learn corresponding terms as they find

those locations. Perhaps names of countries could be placed digitally in a field using an AR game, and as students arrive at different locations, they learn the words for different countries. Location-based AR games could be used in online courses created by instructors so long as the online instructors created location-specific games for the location-based AR games. QR codes would potentially be easier to use in an online L2 course as they would only need a QR code and a smartphone.

Potential Limitations of Using AR for L2 Learning

There are limitations to using AR technologies in DLL that educators would do well to take note of. Here, I will discuss a few of these limitations, and I will provide possible solutions. One limitation is the need for the technical tools whether that be a laptop, tablet, or phone. In many areas, educators cannot expect every student to have these items available outside of school. There are certainly also schools where there are not enough of these technical devices for each student to use. If this is the case, my recommendation is to use what is available. At the very least, if the instructor has a smartphone or laptop and if they can connect it to a projector screen, this can be enough for students to use an AR technology such as a location based AR game or a digital background together. Even one device can be effectively utilized to instruct students.

There are also students who do not enjoy AR location-based games or feel that using technology as a communication tool detracts from their learning experience (Thang & Mahmud, 2017). This could be because of issues of miscommunication or lack of engagement in the L2 classroom. I believe instructors can make the process of using AR technologies for L2 learning more enjoyable for these learners. They can do this by making note of students who may be showing early signs of disengaging from the learning activities and materials and seeking

opportunities to assist them in a one on one setting where they can aid these learners. As an L2 educator, I have seen students disengage from DLL resources and have seen them re-engage when I have spoken with them and helped them to utilize the resources in a way that interests them. The same strategy can be used to assist students who do not immediately see the appeal or the benefit of using AR for DLL.

One more difficulty with using AR technologies in L2 classrooms is the work required from educators to make such technologies effective. Educators may be overwhelmed by the many options for using AR in their classrooms and unsure of how to implement these options. I suggest that they begin by using resources already available for them including ARIS (Phon, et al., 2014). As mentioned previously, ARIS is a software that allows instructors to create location-based AR games without the need for any knowledge of computer programming. They can also use camera filter apps that add or change what users see through the camera by overlaying a digital image. These are some of the potential limitations of utilizing AR for L2 learning, but as I have shown, there are potential solutions to them as well.

Pros and Cons to Digital Versus Face to Face L2 Learning

Having dived into the different modes of DLL and how they are benefitted from AR, it is important to note the pros and cons of DLL and address a few of the counterarguments against this method of L2 learning. There are benefits and drawbacks to digital versus in-person L2 learning. A few of the benefits of DLL are learner autonomy, learners taking the lead in their own L2 education, and learner's increased desire to explore the DLL program or platform (Li & Lan, 2022). What these three benefits have in common is a focus on learners being active participants in their education.

A few of the drawbacks of DLL are difficulty in conducting assessments across DLL programs and platforms, notable gaps between what learners need to know and what these programs teach, and developers/businesses not necessarily having the learners best interests in mind (Li & Lan, 2021). On the flipside, in-person L2 learning may not carry the same benefits or drawbacks. For example, an L2 learner in a face-to-face classroom may have more consistency when being assessed and their instructor will most likely have their best interests in mind. Yet, they may have less motivation to be self-directed and to explore learning platforms and programs outside of the classroom and complete assigned homework.

Another reason a learner may prefer in-person L2 learning to DLL is that some learners are less comfortable using technology or find digital technologies difficult to understand. Some of these learners may also find the self-direction necessary when using such technologies to be challenging. For educators of such students, I suggest using frequent communication and opportunities for formal and informal communication with other learners to increase clarity of expectations and learner accountability. I also suggest these educators emphasize explicit instruction over implicit instruction and frequently ask students if they have questions and prioritize answering them. These suggestions come from my own experience in online classes and are aspects of online learning that I have appreciated instructors using or wished they would have used.

Although in this paper, I make the argument that AR in combination with DLL collaborative learning activities is beneficial for L2 learners; there are still benefits of face to face L2 learning that are difficult to replicate in a digital learning environment. That said, AR can help digital L2 learning environments to gain some of the benefits of in-person L2 learning environments such as hands-on learning opportunities.

AR can lead to very positive results for L2 learners. These results may include, greater focus and engagement, and increased motivation to solve problems and find solutions. It can allow learners to have notable, real connections with new vocabulary. Thus, improving their retention as well. This comes from creating a more immersive learning atmosphere for the L2 learner.

As learner motivation has been mentioned as a benefit for both DLL and AR, I will make note of two specific types of learner motivation and how they related to using AR for DLL. These two types are individual motivation and interpersonal motivation (Malone & Lepper, 1987). The first is fueled by four emotions which are challenge, curiosity, control, and fantasy. The second is fueled by three other emotions which are cooperation, competence, and recognition. It can be observed Malone and Lepper's writings on the subject that individual motivation is more centered on the learner themselves, whereas interpersonal motivation is centered on their interactions with others. AR technologies used alone can increase a learner's individual motivation, but when coupled with cooperative modes of DLL, learners can also have increased interpersonal motivation.

Conclusion

Research into using AR to assist in DLL is still in its infancy, but it can be said that this is an area with great potential to benefit L2 learners, particularly during language exchanges. Telecollaborative dialogues can allow learners to connect with other speakers of the target language and gain both linguistic and cultural knowledge as a result. CMC gives learners opportunities to have more opportunities to participate in LRE's and as such, promotes self-correction. AR tools such as QR codes that show a digital object in a physical space and programs that show the vocabulary term for objects in the target language when they are shown

through a camera lens can enhance telecollaborative exchanges and CMC by being used for more immersive and effective roleplays in the L2. Digital storytelling can be a creative collaborative activity for learners where they utilize digital media to create interesting stories. Virtual backgrounds are a useful tool for digital storytelling as they can create a more suitable atmosphere for learners as they tell stories in the L2. Open online courses often have forums and chat rooms with potential for collaborative dialogues between learners. When instructors utilize location-based AR software for online courses and curriculum, they can provide more interaction for L2 learners. Combining AR with these modes of DLL can; improve engagement, increase learner motivation, improve L2 literacy proficiency, increase interaction, and provide greater immersion. Utilizing the AR technologies available and continuing to utilize those yet to come will increase the benefits that learners see from DLL. As an educator, it can be daunting to know what technologies to incorporate in my lessons and to learn how to use them effectively. Many of the AR technologies mentioned are more straightforward and easier for users to understand whether they are using a simple QR code, or a location based interactive game.

From a teaching perspective, these technologies can be beneficial for L2 learners and educators alike as they lessen the load on instructors when incorporating into digital classrooms and increase engagement among learners. Despite these potential benefits, I have not seen them used very often either as an L2 learner or an L2 educator, and the research cited in this paper attests that more application of this technology in L2 classrooms is necessary to better understand its implications on learning (Punar Özçelik, et al., 2022). More use of AR in DLL collaborative exchanges is likely to lead to all the benefits previously mentioned and possibly more.

Statement of Future Goals and Plans

As mentioned earlier, I do not see myself returning to a classroom as a teacher for the foreseeable future, but I do see a future for myself in education. I have mentioned some of the corporations that are using technology as a tool to aid learners in gaining L2 proficiency. In my current role, I am also part of such an organization. Whether it is in my current role or future ones, I will utilize the knowledge gained during the last few years in this program coupled with my developing skills and understanding of sales, business development, and marketing to benefit learners outside of a teaching role.

During the last few years there are many parts of teaching that I have enjoyed. Working with students and seeing them grow and learn new things has created some dear memories for me, but there is more I want to do, and I am confident that companies using DLL, including my current employer, are where much opportunity lies for me.

As of now, my current employment also pertains specifically to Mandarin education. That said, one of the advantages of pairing my skills in language teaching with skills in sales, business development, and marketing is that these skills are pertinent in any language company, regardless of whether the language that is taught is French, English, or any other language.

Perhaps, in the future I will seek out further professional knowledge in business or technology such as learning about computer science or business administration. It has been inspiring and encouraging to find that there are a multitude of opportunities to assist language learners outside of a L2 classroom setting. The future of DLL is promising and as advances are made in this field, I am excited to be part of it.

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