# Synergy for Heritage Language Education Maintenance of Overseas Chinese Children: An Ecological Perspective

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### **Abstract**

In the post-Covid-19 pandemic era, economic instability and international travel restrictions affected by the plague and more precautious measures taken upon governmental regulations results in a shortage of qualified teaching resources in overseas Chinese language schools (CLSs) and discontinuity of heritage language (HL) education for overseas Chinese children. From the eco-logical perspective, teaching assistance based on information technology for HL education maintenance, especially for those overseas Chinese children who study in CLSs, can be implemented with multiple resources, by integrating the systems of online and offline teaching plat-forms, teaching skills, teaching staff, teaching investment and teaching materials under the collaboration of recourses both in CLSs themselves and recourses from China mainland with the help of information technology. Fragmented and fragile teaching construction can be avoided if CLSs incorporate biological niches like students, teaching staff, and CLS administrators, and non-biological niches like hardware equipment, teaching platform, teaching resources, and teaching methods. By this means, heritage language learners can maintain their HL learning through synergy and coordination of teaching resources, which includes online study apps, online open courses of higher educational institutions in China, and Chinese government support to cope with the impact of the pandemic for its sustainability of heritage language education

Keywords: heritage language education; synergy; information technology; overseas Chinese children; ecological perspective

### 1. INTRODUCTION

The idea of sustainable development is an issue that needs international attention because of its inception with the tag "Our Common Future" at the United Nations Conference in the year 1987 although its initial purpose is for the environment and development [1]. In the United Nations 2030 Agenda for Sustainable Development, one of the sustainable development goals and targets is to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" [2]. This also marks a growth of interest in education for sustainable development. Sustainability in the educational domain is a concern worth discussing [3]. Green practice in educational institutions at all levels is a growing field of consideration and practice [4-9].

Heritage language (HL) is an important part of heritage culture and its education is targeted at the education of transnational migrants who reside in countries other than their ancestorial countries and help to enhance their heritage culture identity [10]. It is the basic way to show the distinctiveness or specificity of a given community, usually encompasses and demonstrates certain characteristics which are common to its people [11]. It can help to obtain more self-concept clarity, promote self-esteem and psychological well-being with several interventions and foster the development of skills for bicultural young children [12]. For transnational children, it's usually an integration of a culturally responsive transformative teaching to enhance student heritage culture identity [13]. However, in the context of the post-Covid-19 pandemic era, economic instability and international travel restrictions are affected and more precautious measures are taken upon governmental regulations, which results in some niches displace in educational ecology of overseas Chinese language schools (CLSs) in which the HL education is implemented for overseas Chinese children. There was unexpected discontinuity and it was cut off in some overseas CLSs at the first half year in 2020 at the beginning of outbreak of the pandemic and still in under great impact. From the perspective of ecology, these problems pose some di-lemmas for sustainability of HL education.

Education assisted by information technology is the most effective human resource development, and it's an indispensable part of the sustainable development of many societies [14]. It lends a hand to the sustainability of HL education and provide practical solutions for CLSs because it is considered a means for learning other subjects, instead of being the learning objective [15]. It primarily constructs technological objects and systems in the learning environment as well as developing abilities [16], which is in line with the goal of HL language. Then how to construct a new model for in the post-Covid-19 pan-demic era on the concept of HL educational sustainability by a synergy of the efforts of all niches all biological elements and non-biological elements needs a discussion. Efforts at all levels such as online study apps, online open courses of higher educational institutions (HEIs) in China, and Chinese government support are important means of information technology-based online and transnational teaching assistance to maintain HL education sustainability in CLSs.

### 2. LITERATURE REVIEW

The purpose of HL education for overseas Chinese children is a multilevel pursuit that can be summarized as language knowledge and competency, as well as a foundation for heritage culture identity [17]. HL education is different from compulsory education in local public schools. For Chinese heritage language learners (HLLs), it is an extracurricular education for overseas Chinese children, which is implemented in some educational organizations or committees in their residential countries, usually in the forms of Chinese language schools (CLSs) or Chinese language centers (CLCs) if the HLLs are intended to learn the Chinese language as their HL [18-19]. Those CLSs are schools aimed at overseas Chinese language Education (OCLE) and provide Chinese language teaching for overseas Chinese children whose parents are usually international immigrants as a heritage language is considered closely related to ethnic identity [20-22]. Namely, overseas Chinese children go to those schools to learn the Chinese language—their HL education—so that they can maintain their

literacy and identity of their HL. Statistics show that there are more than 20,000 CLSs in the whole world and around 400 CLSs in Europe [23-24].

Traditional OCLE in the 1980s provided teaching in line with native Chinese children in China because most CLSs teachers were international migrants from China and they simply borrowed teaching design and teaching methods as what they had been taught in their motherland. In the recent two decades, with the increasing and extensive involvement of information-based teaching practices and construction in CLSs worldwide, a large number of new teaching methods came up and now are taking a considerable part of CLSs, especially after the outbreak of the covid-19 pandemic. However, because of the long-rooted traditional and outdated ways of teaching and the OCLE being taken by surprise by the pandemic, some CLSs are in trouble with sufficient qualified teaching staff, as well as outdated managing policies. Presently, some CLSs are trying to integrate new technology into the sustainability of the development of schools [25-27]. A sole reliance on teachers and classroom teaching is not enough and it is difficult to achieve sustainable development. Therefore, it is necessary to establish a relatively complete model to systematically promote the sustainability of overseas Chinese language teaching. HL education is in its gradual shaping procedure, which means acquiring practical technology to be in compliance with the whole surrounding environment [28].

### 3. EDUCATIONAL ECOLOGY AND HL EDUCATION

The core of the sustainability of education is based on humanistic values, namely, the personality and developmental potential of the children, which is exemplified by its consistency [29]. HL education is a case in point as it links how international immigrants correlate with their ancestral culture, and more importantly how they will maintain their heritage language identity. Hence, the need to go deeper into all aspects of educational processes, during which HL literacy and identity are supposed to be acquired. CLSs are extracurricular institutes, which means they are not as strongly imposed on HL learners as compulsory courses in their public schools. However, the sustainable education of HL education links being a human and individual with the welfare of the cultural and ethnic environment. This allows the expansion of the dimensions of education to the fullest of the perception of the existential relation, not just in an individual way, but also in a more global way with everything existing [30].

In the ecological environment of HL education, students, teachers, teaching man-agers, teaching environment, and teaching contents are all elements of teaching activities, and they should be taken into consideration to accomplish the teaching objectives and strive for an ecological balance. What's more, the uniqueness of HL education determines that the consanguinity linkage between overseas Chinese children and the heritage culture identity of their motherland needs to be factored in. Sustainable development of HL education in CLSs for HLLs happens in multiple ways. It can be used both in and out of class. For teaching in class, a teacher is usually the guide, who can usually organize the interaction of individuals, no matter students or teachers, with the human or non-human components in the classroom settings that surround them. Information technology-based HL education can go beyond factual knowledge by understanding the knowledge cycle and process with scientific reasoning and the relationship of overseas Chinese learners to the larger heritage ecosystem.

Learning outside of class is more complex, which usually involves consistent and ongoing practice under the multi-interaction within their learning system. Sustainable learning helps to link learning at the individual level with com-munities under the social-ecological system framework to bring about transformation and internalization at a different level for overseas Chinese children.

### 4. CURRENT NICHES DISPLACE IN HL EDUCATION ECOLOGY

A niche is the place, employment, status, or activity for which a person or thing is best fitted from the organizational ecology perspective [31], especially for all biological and non-biological elements in HL education after the Covid-19 pandemic. Information technology-based teaching started in CLSs in the 2010s, providing more elements in HL education. However, the investment in equipment and systems at the school level for its development in terms of teaching resources and pedagogical reform are displaced in slow progression. Results of HL teaching reform are unabundant and relatively fragmented. Therefore, the ecological system in HL education is underdeveloped. There are some problems with HL education in CLSs which draw HL language education behind them.

# Unstable structure and unmotivated drive of teachers

Some young teachers in overseas CLSs are part-time and they are nearby overseas Chinese adults with another full-time job or college students in nearby universities doing a part-time job. With the influence of information technology, more and more young teachers have realized the importance of information technology in teaching. However, this awareness is often introduced and taken passively, instead of voluntarily taking up. Moreover, although young part-time teachers have more aptitude in learning, they usually have limited teaching experience and monotonous teaching methods as most college students focus more on their academic career because they are doing diplomatic studies in nearby universities. Most of them have no intention to take up the teaching career in CLSs, so there is no real urge in their willingness of using information technology in teaching as it takes longer time in teaching preparation.

# Limited fund to upgrade teaching facilities

For some CLSs, there is very limited funding for the schools to upgrade their teaching facilities. The best explanation is that: for medium-sized (around 200 students) and small-sized (below 100 students in total) CLSs, tuition fees are the only source of income. The money they charge from CLS students is relatively low and insufficient for in-vestment in the equipment upgrade. Take Florence Chinese Language school in Italy; Bosi Chinese Language school in Spain, Vienna Chinese Language School in Austria and Chinese Language School Affiliated with the Chinese Import and Export Chamber of Commerce in France for example, each student in those schools pays two Euros for each Chinese language class and as Chinese language classes are in small size, most CLSs are barely making the two ends meet. Tuition fees they get from students are used to pay the salaries of teachers which means they are short of the fund to upgrade the teaching facilities. Though they have limited financial resources, they are not intended to increase the tuition fees because students would be scared away if the fees were too high, and ultimately fewer and fewer overseas Chinese children would continue Chinese language learning, which in a long run will affect the consistency of HL education.

### **Dated mindset of teachers**

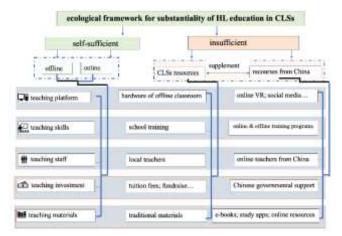
In recent years, large-sized (above 300 students) CLSs with better teaching concepts and more private investment or governmental financial support have invested a lot in hardware and resources for inform-based teaching, but the construction and updating speed of smart classrooms, teaching platforms, and teaching resources are not satisfactory. The problem is that most teachers have not received systematic training. The teaching ideology and mindset of teachers have not fundamentally changed, and the smart classroom has become a "traditional teaching + PPT" classroom and the smart classroom has become a carrier, which is difficult to bring out the desired effect.

### Lack of synergy among teaching system

Information technology-based teaching is a continuous process throughout the whole teaching activity and all resources need to be mobilized to serve students and form synergy among all resources. Classroom teaching is only one part of teaching. Without pre-course preparation and post-course evaluation, the effect of classroom teaching can hardly be effective without the influence of environment and psychological construction. However, at present, CLSs rely too much on mere teachers for the construction of in-formation-based teaching and put too much energy into classroom teaching, neglecting the collaborative improvement of teaching methods and developing teaching resources. They neglect the overall structure planning of information-based teaching, lacking holistic governance of all recourses both in CLSs themselves and recourses outside of schools at all levels, making it difficult to form a synergy.

# 5. LEARNING PROCESS OF INOFORMATION-BASED TEACHING FOR HLLS

In order to achieve sustainable development of education for HLLs, CLSs need to integrate the practical achievements of many aspects to form a synergy and coordinate the complementary advantages of different management levels so as to build a healthy information technology-based HL education ecological environment. Education has the process of material and energy exchange and information transmission with the environment as an organism-like life [32]. In the organic teaching process, all-natural conditions, socio-cultural environment, interpersonal relations, psychology, and other elements related to teaching interact with each other and create ecological relations. In order to avoid the fragmented construction of information-based teaching, CLSs need to incorporate various elements into the construction system of information-based teaching for their niches, such as biological elements like students, teachers, and administrators, and non-biological elements like hardware equipment, teaching platform, teaching resources, and teaching methods, to finally build a strongly driven and ecologically sound teaching system.



**Figure 1.** Ecological framework for sustainability of heritage language education for HLLs in CLSs

Figure 1 shows the ecological framework of sustainable development of HL education for HLLs in CLSs through information technology. CLSs in the world are confronted with difficulties as mentioned above. With the surge of Covid-19 infections and travel restrictions, there are not enough teachers, especially the recruitment of part-time teachers from exchange Chinese students in local universities. And potential candidates for offline teaching are popular because of its scarcity. Another threat is the loss of students. CLSs in the same area compete with each other and offer tuition fees as low as possible, which in turn will hurt the quality of education and downsize the investment in faculty and facilities. Therefore, most CLSs are in shortage or insufficient in resources. There are very few CLSs manage to be self-sufficient but are wary about the uncertainty in the sustainable development of schools since the competition and the pandemic are there.

Information technology-based teaching for HLLs nowadays is different from traditional offline classroom education and characterized by the incorporation of artificial technology as means of assistance, at least that's the case for overseas Chinese children in both offline and online teaching. In the post-pandemic era, more overseas Chinese re-turned to China, which results in a shortage of teachers in CLSs. Information-based teaching for HLLs, especially for those overseas Chinese children who study in CLSs with limited or insufficient resources, can be supplemented with the assistance of multiple resources from China through technology. Current teaching methods in HL Education are assisted with more technology-related teaching resources and methods as supplements to traditional teaching.

# A. Teaching platform

The teaching platform of most CLSs includes offline and online ones, which support CLSs to carry out information technology-based teaching. For offline teaching, CLSs need to upgrade the hardware environment because it's the foundation, such as the construction of a network environment and the construction of a basic teaching environment. The network environment is an important carrier of information teaching and the basis for ensuring the real implementation of information-based teaching with the full coverage of the campus network. For online teaching mode, selecting suitable software to guarantee the quality of teaching is the key to a stable teaching platform. As CLSs have limited funds, it's barely possible to have some AR or VR equipment. But those recourses can be pro-vided by organizations from

China during online teaching. Since 2020, Overseas Chinese Affairs Departments of central and provincial Chinese governments have been organizing a series of online summer (winter) camps to enrich the extracurricular activities of overseas Chinese all over the world through different online apps, such as DingTalk, Xiao'ertong, Zoom, Tencent Meeting, Microsoft team. Statistics show there were over 72, 000 overseas Chinese students who participated in the online camps [33]. Among those camp activities, there are some outdoor-scene lectures and experiencing classes, even live-streaming lectures from China's orbiting space station in 2021[34].

# **B.** Teaching skills

Teaching skills are the key links of information technology, which can be demonstrated by teaching design and teaching methods. The core of information technology-based teaching for HLLs is "student-centered". Therefore, teachers need to continuously improve their teaching skills and update their teaching methods in the teaching design, to help students achieve independent and collaborative learning.

Information technology provides teachers with great efficiency in classroom organization. Those teaching skills can be achieved both ways. It can either be accomplished by CLSs themselves because each school knows about their teachers and students better or through the online training program provided by organizations in China and can result in abundant advantages: First, online information technology for overseas Chinese children can break the time and space boundaries of the traditional classroom, and through some online teaching/learning platform, pre-learning resources and introductory materials can be delivered before class just like the flipped classrooms in China. Teachers from China and students in CLSs can interact and collaborate during class through information technology, and evaluation feedback and extension materials can be provided after class through an online platform. Second, information technology can effectively shorten classroom management time. For instance, to keep class attendance and classroom order in traditional classrooms, teachers need to spend an extra amount of time, but these non-teaching tasks can be done quickly through the information technology platform, such as the attendance checking in DingTalk or in Zoom, which helps teachers save unnecessary time. Moreover, an information technology-based teaching platform enables accurate analysis of the teaching process. Teachers can obtain real-time classroom inter-action through big data, track students' learning evaluation and adjust the teaching content and pace accordingly. Then, by analysis and design of personalized learning targeted at overseas Chinese children. The information-based teaching system provides a platform for students to communicate more efficiently to create a better immersion of HL learning more comprehensively, and achieve communication between teachers and students to tailor teaching to their needs. Up till 2022, the Chinese Language and Culture Education Foundation of China has organized 16 years of online and offline teachers' training programs. Since 2020, it has provided online training for over 15000 teachers from 97 different countries [35].

Information technology also provides teachers with a wide range of teaching methods for HL education, the most prominent of which is to use online platforms to connect re-sources and break the boundaries of the classroom. By providing teaching resources through the online platform, traditional teaching contents such as knowledge and skills can be displayed in front of students anytime and anywhere. Boundaries between teachers and students, through the

interconnection of teaching platforms, teachers and students can quickly keep up with new teaching technology, urging teachers to update themselves.

### C. Teaching staff

The main force for implementing information technology-based teaching is the teaching team. Therefore, the development and integration of informatization resources are important components of teaching ability of CLS teachers. Facing the previously-mentioned problem of shortage of teachers, CLSs can find some local teachers who reside in the country, with better financial incentives if possible. As a supplement, teachers in China who are available for online teaching are another powerful workforce, which means it is immune from geological restrictions. Teachers in China can teach subjects of CLSs in Italy, France or the UK, etc. China was the first country to suffer the impact of Covid-19 and begin online teaching. Therefore, teachers in China are experienced enough to handle online teaching technology. The only problem is the time difference, which can be solved by rearrangement of schedules of CLSs.

Both online and offline information-based teaching is the result of technology, which is a temporary answer to the shortage of teachers in CLSs. For those CLSs doing offline teaching, this is also applicable. The classroom for offline teaching in CLSs has a teaching assistant to manage the class, and the online teacher gives classes with a projector showing his/her teaching and a camera at the back of the classroom to get feedback and interaction with students in the classroom.

### **D.** Teaching investment

Abundant teaching investment means enough money to be put into teaching platforms to upgrade the facilities of the CLSs, which will in turn improve the quality of HL education. Unluckily, limited tuition fees from CLSs students and fundraising from local overseas Chinese associations are the main financial recourse of CLSs in most countries of the world [36]. In recent years, there are hundreds of Model Schools of OCLE (about 200 best CLSs are entitled by central Chinese government) selected from all over the world. Those prestigious schools are entitled to be granted about 10, 000 Euros from the Chinese government as an award for their good quality of teaching, which can help with the financial shortage. Apart from that, teaching resources in other forms, such as hardcopies of teaching and supplementary reading materials, interactive teaching instruments, professional teaching software, online micro-lessons, high-quality video or audio resource, study apps or software, etc.

### **Teaching materials**

Supplementary materials for teaching, such as pictures, animations, and electronic teaching materials can visualize the teaching knowledge, teaching techniques to help HLLs in CLSs better understand the Chinese language learning; the other is the development of interactive teaching resources, such as interactive teaching materials, games, professional software, etc., which are aimed at cultivating students' hands-on ability and autonomous learning.

Teaching modes vary from school to school. Some CLSs stay offline teaching even when local communities are faced with the impact of the Covid-19 pandemic; some schools adopt a hybrid of offline-and-online teaching modes, while others choose online teaching. Information-based teaching can upgrade HL teaching and leave overseas Chinese children with more options to deal with teaching contents, such as high-quality open courses in higher

education institutions (HEIs) in many colleges and universities, e-textbook development, public courses developed by public media, study aids built by enterprises, and generative resources contributed by netizens. There are three major information-based teaching recourses to assist HL education.



**Figure 2.** Synergy of information technology assistance for Chinese HL education

As illustrated in Figure 2, the three major information-based teaching assistances are implemented in multi methods, namely by society, higher education institutions, and governments. An increasing number of study apps are targeted at overseas Chinese children worldwide. Popular apps include Monkey King Chinese, LingoAce, and some other Chinese language study apps, together with more online options for all-around development, such as Sparkles of minds, Zebra Drawing, Preschool Math Paradise, etc. Online open courses of HEIs in China for HLLs offer a variety of training courses that overseas Chinese children can choose from. Those HEIs are usually those universities from homelands of early overseas Chinese migrants, especially from some coastal provinces of China with a long transnational migration history like Guangdong, Fujian, and Zhejiang who still keep a strong bond of geographical links and consanguinity with overseas Chinese, as well as some normal universities with students majoring in international Chinese language education. Efforts from Chinese governmental support at all levels are an important stimulus for teaching assistance in various forms, such as online summer or winter camps for overseas Chinese children, and online training programs for teachers in CLSs.

### 6. CONCLUSION

The sustainable development of heritage language education by information technology-based teaching requires synergy and coordination of biological and non-biological niches of both CLSs themselves and support from China, so that the teaching platform, teaching skills, teaching staff, teaching investment, and teaching materials can work at its full capacity and strive for a better ecological balance to maintain heritage language identity. A new model of online teaching assistance in the post-Covid-19 pandemic era with the concept of educational sustainability is constructed by integrating all recourses of different platforms, with teaching design under a more systematic and mechanism system. Three levels of online resources such as study apps, online open courses of HEIs in China, and Chinese government support can help to achieve better learning outcomes in HL education.

National guidelines and indicators are key issues in providing sustainable input to the alliance by researching the needs of HL education. This will ensure their sufficient access to learn the Chinese heritage language. By the cultivation of a high-quality HL education, it can enhance more engagement in ethnic and heritage culture identity and more involvement in understanding their heritage culture, and more willingness in taking up an international exchange, which in the end can promote the sustainability of their life-long learning.

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