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## **A Design Theory of Engagement for Flipped CFL: Constructs, Mechanisms, and Principles**

### **Abstract**

This design-based research (DBR) study investigates how learner engagement can be operationalized as a set of design decisions within flipped instruction for beginning learners of Chinese as a foreign language (CFL). Flipped formats can expand learning time by shifting initial exposure to content outside class while reserving class time for guided practice and interaction; however, empirical accounts of how to design flipped instruction for novice CFL learners, given the linguistic and orthographic demands of Chinese, remain limited. To address this gap, the study conducts iterative DBR cycles to (a) translate engagement principles into concrete features of out-of-class learning tasks and in-class activity structures, (b) examine how these features shape learners' participation and persistence across the course, and (c) revise the design based on multi-source evidence collected during each iteration. The study documents the evolving instructional design, the data sources used to inform revisions, and the rationale for changes across cycles. Outcomes include a set of engagement-centered design principles and implementation guidance to support the future design of flipped CFL courses for beginning-level learners.

**Keywords:** flipped instruction, task engagement, design-based research, CFL teaching

王婷婷

## 面向翻转式对外汉语教学的参与度设计理论：构念、机制与原则

### 摘要

本研究采用设计型研究（DBR）方法，探讨如何将学习者参与度具体化为一系列可操作的设计决策，并将其融入初级对外汉语（CFL）学习者的翻转课堂教学之中。翻转式教学通过将初始内容学习转移至课外，从而拓展学习时间，并将课堂时间用于引导性练习与互动活动；然而，鉴于汉语在语言结构与文字书写方面的特殊要求，针对初学者如何进行翻转式教学设计的实证研究仍较为有限。为弥补这一研究空白，本研究通过多轮迭代的设计型研究循环：（a）将参与度相关原则转化为具体的课外学习任务特征与课堂活动结构设计；（b）考察这些设计特征如何影响学习者在课程中的参与表现与持续投入；（c）基于每一轮收集的多源数据对教学设计进行修订与优化。研究系统记录了教学设计的演进过程、支持修订所依据的数据来源，以及各轮调整的理论依据。研究成果包括一套以参与度为核心的教学设计原则及实施建议，为未来初级对外汉语翻转课堂课程的设计提供指导。

**关键词：** 翻转教学，任务投入，设计型研究，对外汉语教学

### Introduction

Flipped instructional strategies have been widely implemented across educational contexts, in which lectures and other forms of direct instruction are delivered asynchronously via technology, while classroom time is repurposed for guided, hands-on activities such as small-group collaboration and jigsaw learning (Hamdan et al., 2013; Zou et al., 2020). Over recent decades, flipped learning has emerged as a prominent manifestation of student-centered pedagogy (van Alten et al., 2019), with notable applications in language education (Mehring and Leis, 2018). Nonetheless, the mere separation of online learning and in-class practice does not inherently ensure student engagement with tasks, which remains a central objective in language pedagogy (Egbert et al., 2021).

This underscores the necessity of systematically embedding engagement principles within the instructional design of Chinese language courses to strengthen learners' cognitive, behavioral, and emotional involvement (Wang, 2023). Furthermore, a theoretically grounded examination of curriculum design and implementation can elucidate how design processes unfold, what pedagogical and theoretical considerations educators should prioritize, and how collaborative design teams can function most effectively (Zou et al., 2020).

Traditional research methods that privilege hypothesis testing or the analysis of learner perceptions are limited in their capacity to capture the iterative, contextually situated, and design-oriented nature of theory-based instructional innovations. In contrast, the design-based research (DBR) approach offers a methodological framework capable of documenting both the evolution of the design process and the theoretical insights derived from iterative enactment. Within DBR, theory and instructional design are inextricably intertwined, each informing and refining the other through cycles of implementation and reflection (Dede et al., 2004). To cultivate this reciprocal relationship, Pardo-Ballester and Rodriguez (2009) advocate for the establishment of theoretically grounded design criteria that foster a dynamic interplay between conceptual frameworks and pedagogical realization.

## Literature Review

### Flipped Language Instruction

Although many researchers have asserted that flipped learning can enhance student engagement, studies indicate that it does not always function as effectively as anticipated. For example, research has shown that in flipped college courses, students often report lower satisfaction with instructional delivery because they are unfamiliar with the new learning format and the associated technologies (Chen et al., 2017; Strayer, 2012). Moreover, several studies have found no significant differences in students' knowledge acquisition, anxiety levels, or test performance between flipped and traditional instruction in language learning (Zou et al., 2020; Johnson and Renner, 2012). Researchers have also observed varying levels of student satisfaction regarding web-based and in-class components (Crouch and Mazur, 2001; Fredrickson et al., 2005; Hao, 2016; Zou et al., 2018). The fact that some flipped language learning contexts yield greater effectiveness than others suggest that merely requiring students to study online and practice in class does not necessarily foster enhanced engagement or learning. Drawing on broader educational research, it can be inferred that

each flipped classroom possesses unique characteristics, and thus, a universal instructional model cannot accommodate all learners. Ash (2012) outlined multiple approaches to flipping a foreign language classroom, emphasizing that to support learning, instructors should offer diverse resources and allow students to select materials that best facilitate their acquisition of required content. Furthermore, to address students' diverse learning needs across disciplines and topics, teachers should thoughtfully consider which types of content are most effective for independent study outside of class. As Zhang et al. (2012) reported, in some cases, students can learn autonomously, whereas in others, teachers must provide direct instruction to the entire class. In addition, Zou et al. (2020) emphasized that language instructors should focus on cultivating deep learner interest in content rather than solely assigning video materials, and they recommended structuring tasks carefully to minimize frustration. Likewise, Chinese language teachers must make strategic decisions about how to utilize class time and how best to support students (Wang and Qi, 2018; Zhang et al., 2011).

In the research literature, flipped instruction is defined as a student-centered pedagogical approach grounded in task engagement (Bergmann and Sams, 2012). When effectively designed, flipped instruction can facilitate students' engagement in learning Chinese language and culture. A substantial body of research has examined student engagement within flipped learning environments. Using the tripartite framework of affective, cognitive, and behavioral engagement, Steen-Utheim and Foldnes (2018) explored students' perceptions of their learning experiences in flipped and lecture-based mathematics courses over two semesters, interviewing 12 first-year undergraduates at a Norwegian business school. Their findings revealed higher perceived engagement in the flipped classroom, with seven contributing categories: commitment to peers, recognition, psychological safety, instructor relationship, physical learning environment, collaboration with peers, and use of videos for new content acquisition. Similarly, Lo and Hew (2021) developed empirically and theoretically grounded design principles to promote engagement in flipped mathematics learning, also employing the three-dimensional engagement framework. Studies within the language learning domain have yielded similar insights. For instance, Lian and Jia (2021) examined flipped language classrooms using a quasi-experimental mixed-methods design at a Chinese university, analyzing engagement across four dimensions—behavioral, cognitive, emotional, and social. Their results demonstrated that engagement was enhanced by the quality of out-of-class materials and the effective integration of pre-class and in-class activities. Nonetheless, these studies offer a limited understanding of what specifically facilitates student engagement in flipped language environments and how

engagement principles can be systematically integrated into Chinese flipped instructional design.

### Task Engagement in Language Learning

The literature has defined student task engagement in various ways. Broadly, it refers to students' active involvement in task performance (Lutz et al., 2006; Meltzer and Hamann, 2005). In the context of language learning, Mohammadi (2017) described task engagement as the extent to which learners are immersed in completing a language activity, even when it presents cognitive or linguistic challenges. In this study, task engagement is defined as the deep, sustained involvement that face-to-face or online tasks can elicit in a flipped learning environment.

#### *Facilitators of Task Engagement*

Several factors have been identified as influential in shaping student task engagement in Chinese language learning. Egbert et al. (2021) proposed six facilitators of engagement in their *Language Task Engagement Model*: authenticity, social interaction, learning support, interest, autonomy, and challenge. Building upon this framework, Wang (2015) developed five engagement principles to guide the design of online foreign language and culture curricula for Chinese as a foreign language (CFL) instruction. These principles include:

- Meeting students' needs
- Offering opportunities for students to set learning goals
- Matching task challenges with students' abilities and skills
- Providing clear instructions and directions for task completion
- Creating opportunities for practice and immediate feedback

Wang's (2015) engagement principles overlap with three of Egbert et al.'s (2021) facilitators—authenticity, challenge, and learning support—highlighting their relevance to engagement-oriented instructional design. The present study adopts these three facilitators as guiding principles for integrating engagement into the design of flipped CFL instruction. Each facilitator is discussed in detail below.

#### *Authenticity*

The first facilitator, *authenticity*, refers to learners' perceptions that a task is meaningful, valuable, and enjoyable (Egbert, 2020). In language learning, authentic tasks connect with learners' personal experiences (Davis and McPartland, 2012) and align with their goals, interests, and values. McTighe et al.

(2020) emphasized that authentic learning tasks must be relevant to both practical purposes and learning outcomes. To foster authenticity, instructors must first understand students' real-world needs and design tasks that address their cognitive, emotional, and social development (Wang, 2015; Wang and Li, 2022).

### *Optimal Challenge*

*Challenge* serves as another crucial facilitator of task engagement. When appropriately aligned with learners' language proficiency, challenge can stimulate engagement rather than frustration (Crick, 2012; Czimmermann and Piniel, 2016). Research suggests that optimal challenge motivates learners to extend their abilities and persist in achieving task goals (Aubrey et al., 2022). Instructors can promote this balance by creating a psychologically safe and supportive learning environment (Csikszentmihalyi, 1990; Egbert, 2004) and designing tasks that are slightly beyond students' current skill levels (Lee, 2007).

### *Learning Support*

The third facilitator, *learning support*, emphasizes the instructor's role in scaffolding engagement through guidance, structure, and responsiveness to individual needs (Shernoff et al., 2017). Instructional supports such as clear directions, visual materials, rubrics, and explicit expectations have been shown to enhance students' comprehension and confidence in language learning (Curry and Lillis, 2004; Wang and Li, 2022). Kim (2018) found that when students acquire foundational knowledge and conceptual understanding prior to in-person sessions, they demonstrate higher engagement during subsequent interactive activities. Similarly, El Miedany and El Miedany (2019) observed that explicit instruction improves communication and efficiency in group tasks. Feedback represents a vital component of learning support. Sustained engagement depends on timely, relevant, and constructive feedback that affirms students' progress and clarifies areas for improvement (CAST, 2018; Meyer et al., 2014). When learners receive opportunities to apply their knowledge and obtain immediate, meaningful feedback, their sense of competence and mastery is strengthened—fostering deeper engagement (Fredricks et al., 2004; Niemiec and Ryan, 2009; Sailer et al., 2017).

## **Research questions**

Flipped language learning remains at an early stage of development (Zou et al., 2020). Although prior research indicates that flipped instruction can incorporate principles of task engagement, there is limited empirical work examining how these principles can systematically guide the iterative design, implementation,

and refinement of a flipped Chinese language course using a Design-Based Research (DBR) framework. DBR emphasizes the cyclical relationship between theory, design, and practice, providing a structured lens for exploring how engagement principles can inform authentic instructional materials while generating practical and theoretical insights. This study adopts the three engagement facilitators—authenticity, challenge, and learning support—as a theoretical framework to guide the exploration of the following research questions within the DBR cycles of design, enactment, and reflection:

1. Integration of Engagement Principles (Design Phase). How can student engagement principles be systematically embedded into the DBR-based flipped instructional design for Chinese as a Foreign Language (CFL)? This question addresses the design phase of DBR, examining how authenticity, challenge, and learning support are operationalized in pre-class and in-class tasks. It explores how these engagement principles guide the development of prototypes, inform instructional choices, and shape the sequencing and structure of activities to optimize learner involvement.

2. Emergent Design Principles (Reflection Phase). What design principles emerge as essential for developing an effective Chinese language flipped instructional design? This question relates to the reflection phase, aiming to identify patterns, strategies, and actionable principles derived from iterative cycles of DBR. It examines how the integration of engagement facilitators informs instructional effectiveness, contributes to the broader understanding of flipped CFL pedagogy, and provides a framework for replicable design practices in similar educational contexts.

By explicitly aligning these research questions with the DBR cycles, this study highlights the dynamic interplay between theory and practice: engagement principles guide design, implementation informs iterative refinements, and reflection generates both practical recommendations and theoretical insights. In doing so, the study bridges the gap between engagement theory and the practical realities of designing and enacting a flipped Chinese language curriculum, offering guidance for instructors and contributing to the scholarly literature on DBR and language learning.

### **Research Methodology**

This study employs Design-Based Research (DBR) as its methodological framework, integrating research and design to develop an engaging learning environment for Chinese as a Foreign Language (CFL). DBR, as defined by Barab and Squire (2004), emphasizes actively fostering interactions and itera-

tive improvement rather than solely observing phenomena. In this study, course designers assumed dual roles as researchers and designers, collaboratively shaping instructional materials and teaching strategies through a deliberate process of negotiating content and contextual considerations.

The flipped course design was guided by principles of task engagement, including addressing students' learning needs, aligning task challenges with their abilities and skills, setting clear learning objectives, and providing explicit instruction and guidance. The design process employed an iterative approach consistent with Reeves' (2000) definition of DBR, encompassing four interrelated steps:

- Identification and significance assessment of real-world practice problems
- Solution development through the creation of a design
- Design evaluation
- Reflection on research and design principles

This study adhered closely to Reeves' (2000) four-step framework throughout the CFL course's design, implementation, and iterative refinement, ensuring that both practical innovations and theoretical insights were generated in the process.

### *Design Context*

Design-based research emerges from the enthusiasm and dedication of researchers and practitioners who seek to address practical challenges in real-world contexts (Ma et al., 2009). The development of an interactive flipped Chinese course originated from a systematic effort to identify and resolve instructional challenges through iterative design. Initially, the targeted flipped Chinese language class was adapted from an online course designed for beginner-level students at a rural university in the southeastern United States. The objective of the online course was to equip students with foundational Chinese linguistic knowledge and develop their reading, writing, listening, and speaking skills for basic communication. The course consisted of 15 units delivered through Canvas, the online learning platform. The first unit served as a general introduction, providing an overview of the entire module, while the final unit focused on review. The 13 units in between integrated three key learning components: textbook dialogues, vocabulary, and grammar.

Refinement of the course became necessary after one year of implementation across two iterations. Based on students' evaluations and anecdotal data, it became evident that the original design presented challenges related to content organization and instructional clarity, which could impede learning outcomes and reduce student engagement. Instructors and researchers, as well as independent course reviews, highlighted a lack of cohesion among various language

learning tasks. Additionally, student feedback indicated that the difficulty level of some tasks imposed an unnecessary cognitive burden, while unclear instructions hindered effective task completion.

Guided by the DBR framework, the research team engaged in iterative cycles of design, enactment, and reflection to address these issues. During the design phase, course materials were revised to enhance cohesion among language tasks, align challenges with students' abilities (challenge), and provide meaningful, relevant learning experiences connected to students' interests and goals (authenticity). Explicit instructions, structured guidance, and opportunities for practice with timely feedback were embedded to provide learning support. During the enactment phase, 45 minutes to one hour of the weekly three-hour class session was dedicated to practicing the language content learned online, creating opportunities for instructors to observe students' interactions with the materials and collect ongoing feedback. Reflection cycles involved evaluating the effectiveness of task sequences, content clarity, and instructional scaffolds, leading to further refinements of both online and face-to-face components. The redesigned flipped course, therefore, consisted of an integrated blend of online self-learning and in-class practice, ensuring that engagement principles guided each iterative improvement.

Despite the need for redesign, the research team recognized the value of the previous online course as a foundational prototype for online Chinese language instruction. The content remained significant for supporting students' overall language development, and its organization into 15 units provided a clear structure that enabled students to focus on and manage their weekly learning tasks effectively. Through this DBR-informed approach, the iterative design process not only enhanced the practical effectiveness of the course but also generated insights into the application of task engagement principles in flipped CFL instruction.

### *Participants*

Four designers participated in this study. Three were from the United States, and one was from mainland China. Two of the designers were Chinese language professors, while the other two were instructional design experts from the university's technology center. Three of the designers had prior experience traveling to and teaching in mainland China and Taiwan, which was anticipated to facilitate a more informed and culturally grounded understanding of Chinese language and culture. Additionally, all course designers had experience learning at least one foreign language (e.g., English, Spanish, Russian, or Chinese) and had previously designed and/or participated in online or flipped courses.

The roles of the designers varied throughout the process of redesigning the Chinese course, reflecting the collaborative and iterative nature of DBR. While any designer could suggest revisions or participate in any aspect of the project, general responsibilities were negotiated at the outset. During course development, the professors worked closely with the instructional design experts to establish overarching design requirements, course outlines, and unit objectives. Weekly team meetings provided a structured forum for negotiation, reflection, and iterative refinement of the course topics and instructional components.

Based on these discussions, the designers generated instructional materials and uploaded them to the Canvas platform, after which the instructional design experts reviewed the materials and proposed additional revisions. This iterative process allowed the team to continuously evaluate the effectiveness of the materials and make refinements grounded in both theory and practical considerations.

The design team emphasized the value of multiple perspectives throughout the DBR process. To resolve potential conflicts, all members collaboratively discussed the best solutions to ensure that course topics and examples were comprehensible to American students and clearly delineated within the course. Through this negotiated, reflective, and iterative collaboration, the redesign process exemplified the DBR principles of cyclical design, enactment, and reflection, resulting in a Chinese course that was pedagogically sound, culturally authentic, and aligned with engagement principles.

### *Data Collection*

In this study, data were collected from three major sources: course documents, design notes, and conversation notes. Each data source is described in more detail below.

### *Course Documents*

Documents from the previously used Canvas online course served as the primary source for identifying problems and potential solutions in relation to the task engagement literature and current courses for design evaluation and description. These documents included students' feedback, instructors' comments within the course, course tasks and assessments for each unit, and teaching materials, including video and audio files. Students' feedback and instructors' comments provided the evaluation criteria for this analysis. By examining the course tasks, assessments, and teaching materials, the research team identified necessary modifications to refine the current course materials.

### *Design Notes*

Design notes consisted of two components. The first component included the general course outline, course content, and resources developed by the Chinese course designer and instructors. The second component comprised the revised course outlines and content lists, which were collaboratively created by all course designers through joint negotiation of problems and solutions.

### *Conversation Notes*

Conversation notes documented the collaboration and interactions among all course designers. These notes included online cooperation records created and maintained on Box, an online document management system, as well as meeting notes taken during weekly team meetings. These records captured discussions, decision-making processes, and iterative refinements made throughout the course design process.

### *Data Analysis*

The qualitative data analysis followed a six-step process adapted from established qualitative research procedures (Miles, Huberman, and Saldaña, 2019; Saldaña, 2016; Lincoln and Guba, 1985; McKenney and Reeves, 2019) as shown in Figure 1.



*Figure 1: Six-step process for qualitative research procedures*

In the initial coding, all materials—including design notes, meeting transcripts, instructor reflections, and course documents (including inner-course student feedback and evaluation) —were transcribed, anonymized, and systematically organized in NVivo for data management. Context-specific themes emerged

inductively from the data, guided by task engagement principles (Egbert, 2021; Wang, 2015). Multiple coding cycles (Saldaña, 2016) were conducted. In the first circle, the open and descriptive coding was conducted, followed by axial and pattern coding in the second cycle, supported by analytic memos and inter-coder discussions to ensure interpretive consistency. Triangulation across data sources and researchers was employed to ensure analytical rigor.

For trustworthiness purposes, the study contains audit trails, peer debriefing, and member checking in alignment with Lincoln and Guba's (1985) credibility and dependability criteria. In addition, both member checking and peer debriefing were employed. Peer debriefing was conducted with two independent colleagues who were not directly involved in the course design. In the analysis process, the lead researcher discussed coding decisions, emerging themes, and interpretive choices with them to provide an external check on assumptions, identified potential biases, and ensured interpretations. Inter-coder reliability was assessed by having multiple researchers independently code a subset of the data; the agreement rate was 0.92, confirming the consistency and dependability of the coding scheme.

Following the methodological conventions of design-based research (Barab and Squire, 2004; McKenney and Reeves, 2019), the analysis was iterative, interpretive, and integrative. The overall goal of the analysis is to examine how task engagement principles—authenticity, optimal challenge, and learning support—were interpreted, implemented, and refined throughout the design cycles of the flipped Chinese as a foreign language (CFL) course, as shown in Figure 2.

Engagement Facilitator	Operational Definition in This Study	Example Data Excerpt	Analytic Code	Emergent Design Implication
Authenticity	Learners perceive tasks as meaningful, culturally relevant, and connected to real-world contexts.	“Students said cultural videos helped them see how grammar worked in daily life.”	Cultural context use	Design grammar tasks around authentic communication scenarios.
Optimal Challenge	Task difficulty balances cognitive demand and learner ability.	“We found students disengaged when the quiz was too easy.”	Task difficulty mismatch	Add adaptive challenge levels or optional extension tasks.

Learning Support	Guidance and resources facilitate success without reducing autonomy.	“Adding guided examples helped students apply grammar rules.”	Scaffolded guidance	Provide step-by-step video modeling and feedback templates.
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*Figure 2: Data analysis framework illustrating how the three engagement facilitators guided the coding and interpretation of qualitative data*

## Limitations

### Replicability

Context plays an essential role in the design-based research process. However, because the researchers' interventions are usually culturally embodied, the research context might not always be described appropriately by the researchers (Hoadley et al., 2000). Therefore, it may cause inaccuracy for others to repeat the same study in a different cultural context. In this study, the context of this course task design may differ from typical foreign language courses at the college level that lack a specific educational purpose. However, the general design principles and reflections generated in this study can still offer guidance for designing engaging learning tasks for CFL learning.

### Time

Reeves (2000) claims that DBR focuses on the designing process in which problems, solutions, and methods are refined over time; sound design is iterative, which means that the process of creating something that addresses a goal should be repeated many times to test and refine the designed artifact or process (Hoadley, 2002). In this design process, the initial course served as the first iteration. To overcome this limitation, student documents, such as their online discussions and their in-class feedback, were used to find out how users perceived the task engagement of the redesigned course.

### Design Narrative

The design narrative illustrates how the research team—acting as researchers, designers, and teachers—engaged in iterative refinement of a flipped CFL course. Following Reeves’s (2000) four phases of design-based research (DBR), the project identified authentic classroom problems, implemented theory-informed solutions, and reflected systematically to enhance both practice and theory.

Operating across these three roles was essential. As researchers, the team analyzed engagement data, feedback, and performance to identify persistent challenges. As designers, they translated these insights into prototypes and learning tasks. As teachers, the design team tested the interventions in real classrooms, interpreting learners’ affective and behavioral engagement firsthand. This integration aligns with the Design-Based Research Collective (2003) and reflects the notion that design should occur “in the messy reality of practice,” balancing theoretical rigor and pedagogical sensitivity.

The analysis of the original course, student evaluations, and classroom observations revealed four recurring issues: lack of authenticity, inappropriate challenge, insufficient learning support, and poor integration between online and in-person learning see Table 1.

Problem Category	Description of Issues	Example Evidence from Students / Observations	Pedagogical Impact
Lack of authenticity	Instruction relied on textbook dialogues and rote drills, which were disconnected from learners’ experiences or goals.	“We memorize dialogues that we never use in real life.”	Low motivation and limited communicative competence occur because inauthentic tasks reduce perceived relevance and meaningful language use (Egbert, 2021; Herrington, Reeves, and Oliver, 2010; Gilmore, 2007; Li, 2020).

Excessive cognitive challenge	Vocabulary, grammar, and pronunciation were introduced simultaneously through dense charts and teacher-centered explanations.	“Too much information at once—I get confused between similar words.”	Overload of working memory led to frustration and disengagement, consistent with cognitive-load research and engagement theory (Sweller, 2010; Chandler and Sweller, 1991; Crick, 2012; Pekrun and Linnenbrink-García, 2014).
Insufficient learning support and unclear navigation	Online materials were scattered across multiple folders with vague task instructions and no precise sequencing.	“I don’t know where to start or what’s most important.”	Lack of scaffolding led to confusion and diminished self-efficacy, underscoring the need for guided support (Merrill, 2002; Wood, Bruner, and Ross, 1976; Van de Pol, Volman, and Beishuizen, 2010; Nicol and Macfarlane-Dick, 2006).
Weak integration between online and in-person sessions	Online quizzes repeat classroom material rather than preparing students for communicative use.	“Online work doesn’t connect to what we do in class.”	Fragmented learning limited knowledge transfer, supporting research on integrated flipped and constructivist design (Bishop and Verleger, 2013; Jonassen, 1999; Reeve, 2013; Zhang and Hyland, 2022).

Table 1: Identified issues in the original course design

## Authenticity

Researchers provide a comprehensive definition of authenticity as learners' perception of a task's relevance and value, expressed through its components. In our instructional design, we emphasize three key aspects of authenticity: connections, self-efficacy, and meeting learning needs and goals (Egbert et al., 2021; Wang, 2023). Firstly, learners tend to find a task authentic when it resonates with their experiences. This includes relating the task to their background, culture, interests, previous learning, future learning, and the topics and tools used in the task. If students cannot see the purpose of a task, their engagement and learning will be hindered.

### *Challenges Identified in the Initial Course Design*

Two experienced instructors who had taught the course for multiple semesters noted that while students could recall grammar rules, they struggled to use them spontaneously in speaking or writing. The findings from course evaluation revealed a lack of authenticity and communicative relevance in the online materials, confirming the need to redesign the course to support more meaningful, real-world language use. For instance, the online learning materials closely followed the textbook structure and relied heavily on PowerPoint slides, PDF grammar explanations, and short multiple-choice quizzes. These activities emphasized form recognition rather than meaningful communication. For example, a common online exercise asked students to “fill in the blanks” with measure words or verb forms—e.g., “她\_\_\_李友。” “她\_\_\_美国人。” While such drills reinforced accuracy, they lacked real-world context or interaction, preventing students from understanding how these structures functioned in authentic communication. Further, according to the instructors, students frequently reported that these activities felt repetitive and disconnected from their daily experiences. Analytics data from the learning management system (LMS) confirmed this pattern—completion rates were high, but time spent on each activity was minimal, suggesting superficial engagement.

### *Design responses*

The course was redesigned to balance online and in-person components, strengthening authenticity through meaningful connections, enhancing self-efficacy, and aligning activities with students' learning needs and goals. This transformation shifted the course from a textbook-centered, form-focused structure to a communicative learning environment. During the redesign process, the design team consulted with two experienced instructors who had taught the course for several years, gaining insight into the course's general characteristics and stu-

dents' learning needs. Based on this analysis, the team created instructions to help students set clear learning goals at the very beginning of the instructional page. To achieve authenticity in the online section, grammar and vocabulary were embedded in meaningful, real-world contexts. Instructor-created videos modeled everyday dialogues such as making an appointment or introducing friends, allowing students to observe how linguistic structures function in authentic communication. The design team developed multiple approaches to facilitate vocabulary learning and produced cartoon videos that enabled students to acquire and practice language expressions within authentic communicative contexts.

One designer and instructor noted that students are more likely to be engaged when they feel valued for their individuality, progress, and contributions to peers and teachers, and real-world tasks can promote communicative learning; therefore, authentic materials such as social media posts help further link course content to students' personal experiences and interests. Online collaborative tools such as Padlet (a digital post board platform) and Flipgrid (an online discussion platform) were employed to encourage students to share personalized responses and exchange ideas in Chinese, fostering a sense of community and relevance. Platforms such as Padlet facilitated interaction and collaboration among learners (see Figure 3), while Book Creator enabled teachers to provide personalized reading materials and students to publish and share their written work (see Figure 4).



Figure 3: An example of student post advertisement finding a language partner



Figure 4: Book creator as a tool for personalized reading and student publication.

In the redesigned course, face-to-face sessions were intentionally structured to extend online learning into interactive, communicative practice. The design emphasized authenticity and collaboration, providing students with opportunities to apply newly learned grammar and vocabulary in real-world contexts. Class meetings centered on task-based activities such as group skits, role-plays, and situational dialogues that mirrored everyday interactions introduced in the online modules. For example, students worked in pairs to reenact conversations in a friend's home or describe their school lives in a family gathering, personalizing dialogues to reflect their own experiences. To further enhance authenticity, native speakers and upper-level learners were invited as conversation partners, engaging students in spontaneous exchanges and offering natural linguistic feedback. Instructors also prompted students to respond to questions in Chinese during discussions, reinforcing active language use. Additionally, reading-focused collaborative tasks were incorporated to strengthen character recognition, as students grouped vocabulary sharing the same characters and practiced reading short passages together. Through these integrated design features, in-class learning became a space for creative language application, peer interaction, and authentic communicative engagement.

### Optimal Challenge

Researchers have observed that challenge can serve as a facilitator of engagement when it aligns with students' language learning abilities (Crick, 2012; Czimmermann and Piniel, 2016). To achieve this alignment, scholars recommend designing language tasks that provide an optimal level of difficulty—enough to motivate learners to complete the task without causing frustration or disengagement (Aubrey et al., 2022).

### *Challenges Identified in the Initial Course Design*

The initial course had several pedagogical and design challenges that hindered effective learning and student engagement. An analysis of course evaluations, instructor reflections, and student feedback identified the difficulties, including cognitive load and insufficient scaffolding for student learning. For example, the simultaneous introduction of vocabulary and grammar through a chart-based instructional approach, though intended to foster pattern recognition, led to cognitive overload by overwhelming students' working memory. Learners described lessons as "too much at once" and "hard to connect the new grammar with the words we just learned," reflecting surface-level understanding and difficulty applying grammar in communicative contexts due to divided attention. Furthermore, minimal explicit modeling of pronunciation and the logographic writing system assumed students could master these independently without considering the complexity of Chinese phonology and orthography for beginners. The analysis that shows students struggled to distinguish tones, remember pinyin, and connect writing with classroom activities aligns with the need for structured scaffolding and guided support (Vygotsky, 1978; Wood, Bruner, and Ross, 1976). Furthermore, the design team noticed that limited opportunities for active practice and real-time feedback. Class activities leave students with few chances to personalize language use or build confidence, and the lack of authentic interaction and formative feedback diminishes motivation and engagement, running counter to principles of multimedia learning theory (Mayer, 2014), which emphasize active processing and feedback for deep learning.

### *Design responses*

In response to the challenges identified in the initial course iteration, the design team implemented a series of targeted interventions to improve instructional alignment, cognitive manageability, and learner engagement. The redesign sought to transform the course from a cognitively demanding, instructor-centered format into a learner-centered, scaffolded experience that emphasizes incremental progression, multimodal practice, and continuous feedback.

To address cognitive overload, vocabulary and grammar instruction were separated into discrete, sequential stages. Instead of presenting large information sets through dense charts, each lesson began with vocabulary instruction contextualized through examples and multimedia aids, followed by a focused stage for grammar practice. This design aligned with Cognitive Load Theory, which emphasizes the importance of segmenting complex content to enhance schema construction (Sweller, 2011). Each grammar concept was supported by simplified visual explanations and short formative exercises to promote gradual

conceptualization. The scaffolded sequence enabled learners to process new input efficiently, lowering frustration while promoting accuracy and fluency.

Students first identify vocabulary in meaningful contexts and then apply it within controlled grammar patterns. Recognizing the difficulties students faced with tones and characters, the redesigned course introduced explicit modeling, repetition, and multimodal reinforcement. In the online session, digital playback tools and required pronunciation recordings for formative feedback were added. For writing, stroke order animations, character tracing, and mnemonic visualizations were integrated into the LMS to help students internalize form–sound–meaning connections. In addition, recycling mechanisms—such as weekly review quizzes, mini-dialogues, and self-paced review modules—were added to consolidate prior learning before introducing new material. Regular “spiral reviews” began each class session, revisiting key structures in new communicative contexts. This iterative cycle of presentation, practice, and review reflected principles of spiral curriculum design (Bruner, 1960) and distributed practice (Cepeda et al., 2006), enhancing long-term retention and confidence.

To address uneven pacing and limited reinforcement, lessons were redesigned around a tiered progression model, with “core tasks” required of all learners and “extension tasks” offered for enrichment. For instance, after completing the fixed-course tasks, students can engage in self-paced learning. For instance, students created self-introduction presentations using Panopto and digital storytelling projects using Book Creator, integrating text, images, and audio. Further, formative assessment was embedded at every stage through pronunciation recordings, self-check quizzes, and reflection journals. Feedback was immediate and personalized, allowing students to identify errors and track progress.

In addition to online learning, pronunciation instruction was reinforced in class through instructor demonstrations, such as modeling tone pairs and having students repeat with visual tone graphs displayed on slides. Instructors also employed color-coded task menus to organize and differentiate communicative group activities. For example, green tasks focused on simple exchanges, such as greeting a classmate or asking for someone’s name. In contrast, blue tasks required more extended dialogues, such as describing one’s family or daily routine. This system allowed students to select activities that matched their proficiency level while still pursuing shared learning goals. Furthermore, after completing the online self-paced modules on vocabulary and sentence patterns for self-introduction, students were challenged to deliver short presentations introducing themselves in Chinese—stating their names, nationalities, and hobbies—thereby integrating the pronunciation, vocabulary, and sentence structure learned through both online and in-class instruction.

### *Learning Support*

Learning support emphasizes the instructor's role in scaffolding engagement through guidance, structure, and responsiveness to student needs (Shernoff et al., 2017). Clear directions, visual aids, rubrics, and explicit expectations enhance comprehension and confidence (Curry and Lillis, 2004; Wang and Li, 2022). Foundational knowledge acquired before in-person sessions boosts engagement in interactive activities (Kim, 2018), while explicit instruction improves communication and task efficiency (El Miedany and El Miedany, 2019). Timely, constructive feedback reinforces progress, clarifies areas for improvement, and fosters competence and deeper engagement (CAST, 2018; Fredricks et al., 2004; Niemiec and Ryan, 2009; Sailer et al., 2017).

### *Challenges Identified in the Initial Course Design*

The design team's observations highlighted the shortcomings of the original course's instructional design in providing sufficient learning support for students to acquire information effectively. The design team recognized that improvements could be made to the comprehensive instruction and navigation of the online course to offer students more explicit guidance and more efficient learning support. One particular area of concern was the navigation, which needed a comprehensive overview. Short descriptions under each title and subtitle on the main page resulted in students spending extra time trying to understand the course structure and determining where to go and how to set their learning goals.

### *Design responses*

To address these issues in the redesign, the design team reorganized the learning content into weekly modules, as exemplified in Figure 7. This design approach recognizes that clear instructions are crucial in engaging students with their learning tasks, as explicit guidelines and explanations help them focus and concentrate on their objectives. In addition, there is an inclusion of detailed descriptions of the learning tasks, providing students with a clear view of the course's overall structure, which facilitates effective task planning. Moreover, the redesigned learning module emphasized a student-centered approach, granting students autonomy in deciding what, how, and when to study during their learning process. Students could plan their learning tasks in any order, enabling them to create personalized learning schedules.

### Implications of the Design Principles

The redesign of the Chinese as a Foreign Language (CFL) course illustrates how a structured, iterative design process can bridge theory and practice within a design-based research (DBR) framework. The process began with evidence-informed problem identification, using inner-course student feedback, LMS engagement data, and assessment results to pinpoint challenges such as decontextualized materials and difficulty applying grammar in communicative contexts. For example, analysis revealed that students struggled to use sentence structures for describing personal spaces or ordering food in realistic scenarios.

Researchers, instructors, and instructional designers, sometimes with two individuals sharing multiple roles, such as both designing and instructing—collaborated to define objectives and integrate perspectives from theory and practice. Instructors identified grammar points and language functions most relevant to students' real communicative needs (e.g., expressing preferences, conversations in different communicative contexts), researchers provided guidance on scaffolding tasks and aligning them with task engagement theory, and designers developed interactive modules using videos, cultural visuals, and tools like Padlet and Flipgrid to support peer interaction and reflection. These overlapping roles enabled a more dynamic, integrated design process: insights from classroom practice could immediately inform theoretical decisions, tasks could be adapted responsively to student needs, and team members gained a richer understanding of multiple perspectives. At the same time, careful coordination ensured that responsibilities remained clear and balanced, preventing overextension while fostering creative, collaborative solutions that strengthened both instruction and design.

A key feature of the process was iteration and prototyping. Initial conceptual models were translated into content prototypes, such as a module where students practiced introducing themselves through multimedia assignments (e.g., making instructional videos, posting on digital boards to find a language partner). These prototypes were tested, observed, and refined based on student engagement and performance data in the course. For instance, when students struggled with voice-recorded dialogues, the team added step-by-step guides and sample recordings, improving task completion rates and confidence. This iterative approach had several implications: it allowed the design team to respond quickly to learner needs, ensured alignment between instructional goals and actual student performance, and fostered a continuous feedback loop between theory and practice. Additionally, prototyping encouraged experimentation and innovation, helping the team identify effective strategies for scaffolding, engagement, and multimodal learning before full-scale implementation.

Collaboration and reflection were embedded throughout. Designers from American and Chinese backgrounds contributed unique insights, ensuring cultural authenticity in materials such as restaurant role-play scenarios and festival-themed dialogues. Regular reflective meetings allowed the team to discuss challenges, refine instructional strategies, and negotiate trade-offs in content presentation. This process reinforced DBR principles, showing how iterative cycles, collaborative problem-solving, and reflective practice can generate both practical innovations and theoretical insights. The implications of this approach are multifaceted. Since it highlights the importance of diverse perspectives in creating culturally authentic and pedagogically effective materials; second, it demonstrates that structured reflection within collaborative design teams can accelerate the identification of design challenges and inform evidence-based adjustments; finally, it underscores how the dual roles of instructor and researcher can be leveraged to bridge theory and practice, ultimately contributing to both improved learning experiences for students and the advancement of instructional design knowledge.

Overall, emphasizing the design process highlights DBR's value in producing learner-centered, adaptable, and contextually grounded courses. Future iterations will continue this cycle to expand task variety, provide additional scaffolding for challenging activities like voice recordings, and enhance opportunities for student autonomy and authentic language use.

## Conclusion

This research examined how task engagement principles can be systematically integrated into flipped Chinese as a Foreign Language (CFL) instructional design for teacher education students. Through an iterative, DBR-informed curriculum development process, the design team was able to identify and address challenges within the teaching context, while effectively responding to the research questions. The study highlighted how collaboration and interaction among researchers and designers formed the foundation for the design's enactment, negotiation, and reflective refinement.

The DBR cycles of design, enactment, and reflection guided the integration of the three task engagement facilitators—authenticity, challenge, and learning support—into both online self-learning and face-to-face classroom practice. By aligning course tasks with students' needs, providing meaningful and relevant learning experiences, structuring challenges appropriately, and embedding clear instructions with timely feedback, the course design promoted sustained student

engagement while simultaneously informing the ongoing refinement of instructional materials.

Ultimately, this design-based research study provided a deeper understanding of CFL teaching and student learning in authentic educational contexts. It generated practical design principles that can guide the development of future Chinese flipped course curricula and illustrated how engagement principles can be operationalized in real-world instructional settings. In summary, this research demonstrates how task engagement principles can be embedded within flipped foreign language and culture learning, while also reflecting on the iterative processes through which these principles inform and enhance flipped instructional design.

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