Weaving the Strands: Tangible Board Game Design for Integrated and Collaborative ESL/EFL Learning

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Abstract: Designs to support early English language learning often segregate language skills and neglect social engagement. To address the gap, we propose a design-based research study to create a tangible board game with the goal of supporting engagement, collaboration, and scaffolding through game mechanics. The game foregrounds verb tense learning as the salient learning goal to engage stakeholders (parents, instructors, and children). We discuss theoretical and practical implications for designing board games to support ESL/EFL learning.

Background and theoretical lens

Developing English learners' reading, writing, listening, and speaking skills is fundamental for student success in the United States. Oxford (2001) uses a textile metaphor, arguing that the tapestry of English learning is woven from strands of skills, context, social engagement, and teachers. While the ideas of such integrated and collaborative learning have been widely accepted in formal settings (e.g., Massachusetts Next Generation ESL Project, 2016), many technology-based interventions only target one or two skills in isolation (e.g., Pearson's "QuickReads" for reading and vocabulary) and lack collaboration dimension. Among ESL learners, students who learned English as a foreign language (EFL) in China compose the largest international student group. However, the emphasis on testable skills and the neglect of collaboration exert similar constraints on learners' outcomes.

This poster describes our efforts to design a novel learning environment solution primarily informed by the theoretical lens of cueing forms. Horn (2018) defines cueing forms as cultural forms of literacy, learning, and play that invite participation into patterned social activity while cueing individual's resources that can bring to novel learning experiences. Horn argues that games (and board games in particular) are a powerful type of cueing form that can shape how participants engage in learning experiences. We are interested in physical games, rather than purely digital video games, due to their entanglement within material and social realities (Horn, 2018), and we choose *board games* because of their ability to engage children in patterned activities such as reading rules, strategizing, and communicating ideas, which could be potentially designed to support language skills.

Methods

The target audience of our pilot are EFL learners, their parents, and their instructors from Shanghai public elementary schools. Oxford (2001) claimed that a course aimed at developing a specific language skill could effectively involve the development of other related skills if the instruction is creative. Accordingly, we invited 9 English teachers from Shanghai public systems to do a pilot survey to help us determine the specific goal of the game. The survey asks about instructional challenges and opportunities. Based on the survey results, we propose to take verb tense, a grammar topic that is hard to teach and learn, as the nexus for our game design.

Next, we conducted the design-based research process with four iterations following the conceive-build-test cycle for the distillation of design principles and practical prototypes. To develop these DBR products, we examined two research questions: (1) how the scaffolding components work, and (2) what the system dynamics are over time. For each round of testing, we conducted pretest surveys, prototype testing and observation, and posttest interviews. The first testing was implemented on 5 native speakers for a quick insight into the game affordance. The other three rounds of testing were conducted on target audience whose native language is Chinese. The second testing involved one parent-child dyad in informal settings (the second-grader is at the novice level of English proficiency); the third and fourth testing involved one elementary school teacher and 4 fifth-graders in formal settings (these intermediate-level students have sufficient training in the knowledge of tense). For testing 3 and 4, we used activity theory, which takes the activity system as the minimal meaningful context to understand learning (Barab et al., 2002), as an analytical tool to understand how the game mediated learning overtime (RQ2).

Design overview

Our prototype game called Tense Universe is shown in Figure 1. Tense Universe is a board game with a physical game board, cards, and tokens. The learning goal is to have students practice tense while also informing English language literacy. Target participants are elementary school students, their teachers, and their parents in Shanghai public school system; potential participants can be ESL/EFL learners who want to improve their knowledge of tenses and their language skills in an integrated manner. We think of the mediation factors between participants and learning objects as potential scaffolding components. The *tools* include the game board with the guides and

rules on it and the game cards that make verbs and nouns tangible. The verb cards have visual representations (colors represent past, present, and future; the icons represent simple, continuous, and perfect) to scaffold tense learning; the cards can be grouped for variable educational needs. The *rules* consist of two options. The default rule asks players to utilize verb cards with various tenses and a random noun card to make a coherent sentence to collectively build up to the chain story; extra points will be given if they use multiple verb cards; the judge points out errors and assigns points. The end users can also create their own rules. The rules encourage both collaborative learning and participatory design. The *divisions of labor* (players, one judge, and one facilitator) engage stakeholders such as parents and instructors. The *community* can be classroom microculture or family microculture.
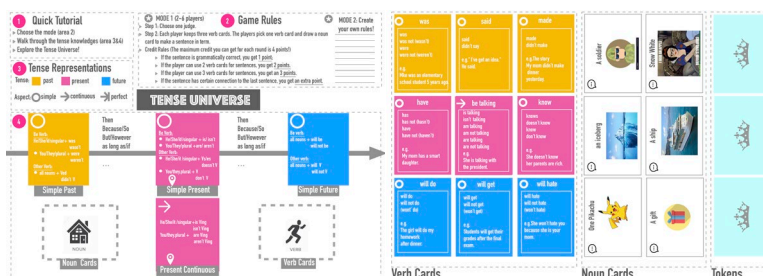

Figure 1. The Tense Universe game board (left), cards, and tokens (right).

Preliminary findings and design principles

The interwoven design process and user testing yielded the following findings for the research questions.

RQ1: How the scaffolding components work. The students at different language levels were able to move toward the learning goals mediated by the scaffolding components. In terms of the goal of verb tense learning, the *visual representations* of tenses work better for learners at lower level, while the *game rules* inspired learners at higher level to make more complicated sentences; the *divisions of labor* prompted players to try for more tokens and prompted judges to pay attention to grammatical mistakes. In terms of our goal of supporting English literacy, participants engaged in reading tutorials and rules. They practiced speaking, listening, making sentences, and helping collectively build up story chains. The components seemed to motivate students to learn more. One student said, "I want to play the advanced version with perfect tense" after noticing a new untested tense.

RQ2: What the system dynamics are over time. Through the lens of activity theory, we discovered four tensions that drove change within the system. Take "designing new rules as an object" versus "the updated rules for higher-level learning" as an example. In iteration 4, the students collectively created a new game rule, which in turn enabled them to electively craft higher-level sentences. The new rule was an improvement that we adopted for the final game. This analysis also helped us locate gaps in the physical game design. The full poster will present supplementary digital interfaces as a solution in more detail.

We settled in on the following *design principles* for ESL/EFL learning environment design: (1) Leverage cueing forms to engage participants; (2) Choose the learning topic that matters to stakeholders as the salient learning goal; (3) Design scaffolding within the context of the patterned activity; and (4) Leverage system components to engage end users to customize or co-design the intervention.

Discussion

Although the pilot has some limitations, such as a small sample size and focusing only on EFL students, the results are worth investigating to benefit ESL/ESL students more broadly. Our next step is to conduct the design iteration(s) on ESL learners to explore how the scaffolding components work differently on EFL learners and ESL learners, and to modify the design principles accordingly. Future work involves the evaluation and realization of digital interfaces, measures of effectiveness compared with other conventional activities, and other research about integrating this hybrid digital/physical board game into formal curricula and out-of-school programs.

References

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