

Cultivating Students' Writing Habit in a Game-based Learning Environment

Calvin C. Y. LIAO^{a*}, Wan-Chen CHANG^b, Hercy N. H. CHENG^a, & Tak-Wai CHAN^c

^a National Engineering Research Center for E-Learning, Central China Normal University, China

^b Department of Human Development and Family Studies, National Taiwan Normal University, Taiwan

^c Graduate Institute of Network Learning Technology, National Central University, Taiwan

*CalvinCYLiao@gmail.com

Abstract: This study focused on delineating and utilizing “habit loop” framework: cueing environment, routine, and satisfaction. This study further integrated the habit loop framework into portfolio management game for helping elementary school students to write and rewrite to cultivate good writing habit. According to the habit loop framework, we also proposed two design principles: portfolio visualization and management. The former supports cueing environment; the latter increases satisfaction. Students performed their routines (i.e., writing and rewriting) in a portfolio management game. Briefly, this study creates an environment more conducive to students' writing to cultivate their consistent habit.

Keywords: portfolio management game, writing habit, habit loop

1. Habit and Habit Loop

Practitioner, educators, and parents have long acknowledged the importance of cultivating students' good habit for writing (Duhigg, 2012) because writing involves a persistent and stable change in what students know or does (Zimmerman, & Risemberg, 1997). Forming useful and productive writing habits is important for students. Specifically, habit formation is often related to interest and persistence. Briefly, habit is a routine of behavior that is regularly repeated and tends to occur unconsciously (Duhigg, 2012). “Habits are the result of automatic cognitive processes, developed by extensive repetition, so well-learned that they do not require conscious effort” (Ronis, Yates, & Kirscht, 1989, p. 219).

While considerable attention has been paid in the past to research issues of Health Psychology (e.g., drinking a lot of water or doing exercise regularly), the literature on issues of Educational Psychology has emerged only very slowly and in a more separate way. A previous study (Chen, Chan, Liao, Cheng, So, & Gu, 2015) proposed a framework of “James' Habit Loop” to promote habit formation. In particular, Chen et al. (2015) adapted from the framework of Duhigg (2012) (i. e. a cue, a routine, and a reward) and, proposed a habit formation framework in the context of education and learning which consisted of three components: *cueing environment* (e. g. arrangement of place, time, people, or incidents), *routine* (e. g. repetitive pattern of activities), and *satisfaction*, forming the habit loop, see figure 1. In other words, habits are automatic behavioral which responses to environmental cues, develops through repetition of behavior in consistent contexts, and reinforces a students' satisfaction. In short, to create a habit, students need to repeat the behavior in the same situation.

Moreover, it is known that the game-based learning approach has great potential for facilitating the engagement of students in learning activities. For example, Proske, Roscoe, & McNamara (2014) explored the motivational aspect, like in game-based practice for writing. Many researchers also believe that sustaining motivation is critical for transforming learning from the use of digital games to educational goals (Barab, Thomas, Dodge, Carteaux, & Tuzun, 2005). Essentially this framework is a phenomenal hypothesis and lacks empirical investigation; hence this study integrated this idea of habit loop into portfolio management game, entitled Creation-Island (Liao, Chang, & Chan, 2016) for helping elementary school students to write and rewrite to cultivate

students' writing habit. In other words, this study created an environment which is more conducive to students' writing to cultivate their consistent habit. Besides, daily writing habit not only shows a way to think out loud but also deepens a conversation with oneself. If students could get in the habit of writing every day, writing habit will help students to organize one's thoughts and get one's ideas. We hope it could help students form a new good habit and break old "not-so-good" habit. In short, this study adopted that the habit loop with game-based learning approach to provide a mechanism for establishing new behaviors and writing habit formation.

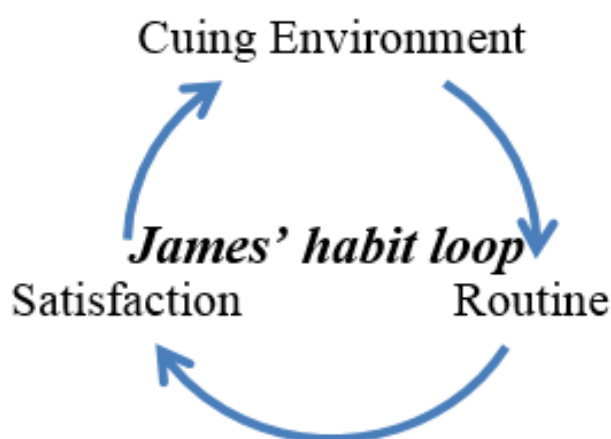


Figure 1. James' Habit Loop

2. Portfolio Management Game

Creation-Island (Liao, Chang, & Chan, 2016) provides an engaging island-construction environment which students can build and maintain an island with residential, commercial, and industrial buildings (i.e., reading for creating), and invest myself money from other students' island in order to attract tourists' attention and interest (i.e. talking about revising). In particular, the Creation-Island incorporates many elements into an island, using a simplified interface designed to be intuitive for young students. Follow habit loop framework, and this study proposed two design principles: *portfolio visualization* and *management*. The former supported cueing environment; the latter increased satisfaction; students perform their routine (e.g., writing and rewriting) in a portfolio management game.

2.1. Portfolio Visualization: Creation-Island as Open Student Model

This first design principle is related to the information visualization of students' portfolios which helping them to understand their efforts, progress, and achievements (Paulson, Paulson, & Meyer, 1991). From a broader perspective, the visualization of students' portfolios is related to the concept of open learner models are learner models that are accessible to the user (Bull, & Kay, 2007). Recently, open learner model also designed in sophisticated form, such as animal companions to motivate children to learn (c. f. Liao, Chen, Cheng, Chen, & Chan, 2011). These studies found that the strategy providing different perspectives towards open learner models have positive impacts on students. Because of opening students' portfolios what students have learned to the students themselves and allowing them to observe, edit, or negotiate with the educational system as well as interact with learning peers (Bull & Kay, 2007).



Figure 2. Login Bonus are rewards given for logging into the game daily.

Thus, this study proposes a design principle to visualizing the learning products and habits for students in educational settings, and to concretize the learning portfolios so that students can become more aware of their learning status and further cultivate their good habit of writing. For example, login bonus is rewards given for logging and writing into the Creation-island daily, see Figure 2. These rewards include Educoins and Experience point. There are two different login bonuses, a consecutive bonus and total days logged bonus. The following login bonus rotates on a 5-day cycle. Once students finish the cycle, the game does not reset the number of days, but the rewards do reset. If students miss one or more days and break the consecutive login streak, the next time you log in will begin at day one again.

2.2. *Portfolio Management: Writing Daily Record as Self-monitoring*

The second design principle is related the portfolio management of students' writing activities which help them to record daily writing. Kay (1997) advocated the usage of learning profiles to promote self-reflection and self-monitoring, and stated: "it should make it available to the learner for improving their learning through better self-knowledge (Kay, 1997, p. 18)". In Creation-island, the buildings changing provides the student with a "visible" learning status. In particular, the statuses of island map change according to the students' learning progress and performance. In this way, the students' awareness of self-reflection might be enhanced.

Moreover, existing research agrees upon the critical role of self-monitoring during writing (Graham, Harris, & Mason, 2005) especially for learning to write. In other words, based on previous literature on the key role of self-monitoring in self-regulated learning, students were provided with opportunities to self-monitor their writing through self-evaluations on both their writing.

Hence, this study proposes that daily writing record may promote students' monitoring on their writing, see Figure. 3. In particular, Creation-island provided a personal tracking tool (i.e., writing habit records) as the weekly report. It keeps track of students' writing trends and gives student daily stats on their writing as well as badges for their accomplishments that keep things fun. Keeping track of trends could a very powerful tactic for developing any new habit. Briefly, this study designed a calendar in Creation-Island and marked a record for every day that students worked on their routine (i.e., writing). Eventually, students' trend became so long that he kept going just because a student didn't want to break it.



Figure 3. Weekly report was represented the writing habit.

3. Remarks

This study focused on delineating and utilizing “habit loop”: cueing environment, routine, and satisfaction. Based on above idea, this study also proposed two design principles: portfolio visualization and management to cultivate students’ good habit for writing in a portfolio management game. In other words, Creation-island is a portfolio management game where supports students to do their daily writing. In Creation-Island, students could build their island or invest others’ islands to practice different theme-basic articles at the same time. To make writing a regular practice and reach to game goal, students have to develop regular habits in their learning process. To exert a long-term impact on student writing learning, a natural way is to cultivate writing with interest as a habit, desirably a lifelong habit.

The upcoming work is to experiment in a 4th-grade classroom as a pilot. In the experiment, we are going to involve our design in the writing courses. The designed activity will be a task of their Chinese class. In particular, teachers could use Creation-Island as a part of their classroom instruction for students to practice and master specific concepts. Students could also use Creation-Island on their own time and at their own pace to prepare for writing that is more difficult for them to understand. Hence, we will have an opportunity practically to examine the habit loop frameworks in a primary school to understand students’ behaviors and competence for writing habit. Next, we will also explore this framework to understand whether cultivating students’ good habit for writing. We hope that future research will provide more detailed results.

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