Bilingualism: Language and Cognition

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Cite this article: Chien T-C, Hung H-C, Ku Y-M, Wu DH, Chan T-W (2022). Some thoughts on extending digital language learning research. *Bilingualism: Language and Cognition* **25**, 384–385. https://doi.org/10.1017/S1366728921000821

Received: 24 August 2021
Accepted: 25 August 2021
First published online: 8 November 2021

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CAMBRIDGE UNIVERSITY PRESS

Some thoughts on extending digital language learning research

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While the target article illustrates exciting digital language learning (DLL) (Li & Lan, 2021) research revenues, we raise a question and suggest two possible extensions.

In contrast to the ease of learning one's first language (L1), adult learners of a second language (L2) are disadvantageous on at least two aspects: their neurocognitive plasticity characteristic of early childhood may become limited, and their environment may not be optimal to support the acquisition of the foreign language.

As a sample case, the target article highlights the advantages of contextualized L2 word learning, and emphasizes the importance of providing adult L2 leaners with child-like environment where they can immerse themselves in situations similar to those that L1 children experience. However, the task for adult learning of L2 words mostly resembles the process of mapping a new L2 word form onto a pre-established L1 concept, whereas the task for a child learning L1 words is to simultaneously acquire a new word form with its associated new concept (Jiang, 2000). As indicated by Jiang (2004), "Under many circumstances, the core meaning of an L2 word and its L1 translation are identical and a learner can use an L2 word both receptively and productively without making an error based on the transferred core meaning" (p. 105) – consequently, when an adult encounters a word like 'spoon' in a DLL environment full of multisensory information about a known concept of 'spoon', it is questionable that the adult would be eager to explore the use of the spoon when they already have rich representation of 'spoon' in their L1. The lack of cognitive and emotional drive might not trigger a child-like learning experience.

DLL approach points to promising directions to assist L2 learning by taking advantage of a wide range of emerging technologies such as mobile computing, VR, and digital games, AI, internet of things, big data analysis, and others. For a broader and synthetic view of DLL environment and the concern of continuation of learning under COVID-19 or similar situation in the future, we suggest developing a form of SEAMLESS DLL by taking into account the concept of SEAMLESS LEARNING proposed by Chan, Roschelle, Hsi, Kinshuk, Sharples, Brown, Patton, Cherniavsky, Pea, Norris, Soloway, Balacheff, Scardamalia, Dillenbourg, Looi, Milrad, and Hoppe (2006). "Seamless learning implies that a student can learn whenever they are curious in a variety of *scenarios* and that they can switch from one scenario to another EASILY and QUICKLY using the personal device as a mediator." (p. 6). Here *scenarios* refer to learning individually or with others, face-to-face or at a distance in classroom, campus, home, zoo, museum or outdoors. Seamless learning emphasizes the CONTINUITY of learning experience across different scenarios. This is exactly the essence of RESILIENT education needed in a pandemic era: continuing learning experience without disruption by switching environments EASILY and QUICKLY.

DLL does enable better teaching practices and product design from cognitive, social, affective, and neural dimensions. In line with this, we suggest extending the current DLL framework by incorporating Interest-Driven Creator (IDC) Theory (Chan, Looi, Chen, Wong, Chang, Liao, Cheng, Chen, Liu, Kong, Jeong, Mason, So, Murthy, Yu, Wong, King, Gu, Wang, Wu, Huang, Lam & Ogata, 2018; Chan, Looi, Chang, Chen, Wong, Wong, Yu, Mason, Liu, Shih, Wu, Kong, Wu, Chien, Liao, Cheng, Chen & Chou, 2019; Wong, Chan, Chen, Looi, Chen, Liao, King & Wong, 2020; Chen, Chan, Wong, Looi, Liao, Cheng, Wong, Mason, So, Murthy, Gu & Pi, 2020). The theory focuses on three anchored concepts – creation, interest, and habit (see Figure 1) – which are largely ignored in Asian education because of its considerably examination-driven nature. IDC Theory may play the role of guiding future Asian education innovation.

In short, IDC Theory emphasizes long-term cultivation of learning interests: that is, the gradual cultivation of learning interests through a long-term establishment of habits. In the case of reading, for example, students cultivate the reading habit through a regular daily reading schedule and gradually foster reading interests. DLL researchers can investigate issues

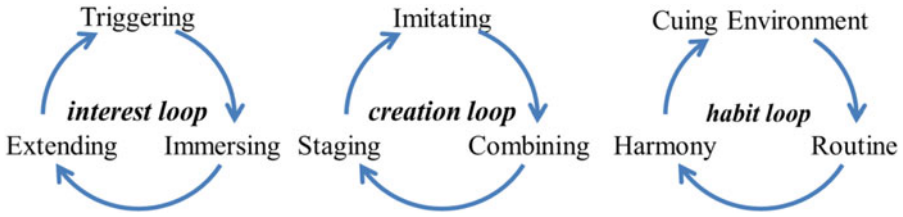


Fig. 1. Interest Loop, Creation Loop, and Habit Loop

related to the interest loop to explore how to trigger students' interest, how to bring students an immersive learning experience, and to further extend such steps into another loop in the long-term perspective.

IDC Theory also agrees that social effects can be used to trigger students' motivation and to enhance their performance through peer-response interactions. In the case of writing, for example, students can improve their writing products through group discussions and peer feedback. DLL researchers can specifically explore how to elicit students' motivation through social effects.

Finally, IDC Theory not only emphasizes the cultivation of students' interests in learning, but also places more emphasis on long-term formative assessment, including the tracking of long-term learning behaviors. For example, students' reading portfolios and creative productions are commonly used to assess students' learning performance in reading and writing. Similarly, DLL's designers and researchers can analyze long-term learning portfolios to understand students' learning interests, habits, and performance in stages.

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https://doi.org/10.1017/S1366728921000821 Published online by Cambridge University Press