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Using Digital Storytelling on Scratch to Support Primary School EFL/ESL Students' Writing: A Self-regulated Learning Approach

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Abstract: Self-regulated learning (SRL) is proved to be an effective learning strategy both in a real classroom and in online environments while digital storytelling (DST) is an emerging strategy for teachers to guide their students to learn a language by integrating multimodal artefacts to develop language and communication skills. However, little research has been conducted to investigate their integration, namely, self-regulated digital storytelling (SRDST) for language learning. This proposed study aims to probe the impact of SRDST supported by Scratch, as a new pedagogy and a learning strategy, on learning outcomes and motivation of primary students who learn English as a foreign /second language (EFL/ESL). The study will be guided by the following research questions: 1) How effective is SRDST on Scratch in supporting students in English learning? 2) In what ways and how do primary EFL/ESL students learn English writing through SRDST? 3) What are students' perceptions of the overall SRDST in the English language classroom? 4) What are teachers' perceptions of using SRDST to teach English? In this study, a pre-and post-test quasi-experiment research design will be employed involving about 120 primary grade 4 students. The control group will be instructed based on student textbooks, paper-formed worksheets, and presentation slides. The experimental group will be instructed based on the SRDST approach on Scratch supplemented by paper-formed worksheets and presentation slides. Both quantitative and qualitative data will be collected to yield research findings and answer the research questions.

Keywords: Self-regulated learning, digital storytelling, EFL/ESL, English writing, primary students, computational thinking, Scratch, innovative pedagogy, learner motivation

1. Introduction

Self-regulated learning (SRL) or self-regulation is a conceptual framework to understand learning through cognitive, metacognitive, behavioral, motivational, and emotional/affective aspects (Zimmerman & Schunk, 2011; Sha et al., 2012). SRL can be used as a stand-alone pedagogy or combined with other pedagogical approaches to facilitate student-centred learning (Barrett, 2006). While many researchers investigated the effectiveness of SRL in higher education and adult education both offline and online in the past years (Vanslambrouck et al., 2019; Carter Jr et al., 2020), previous studies proved that SRL can improve young learners' learning outcomes, learning strategies and motivation (Dignath et al., 2008; Hung et al., 2012). Researchers also believed that SRL can foster sustainable lifelong learning skills as it can cultivate learners' generic abilities, such as problem-solving skills, digital competencies, and learning

autonomy (Anthonysamy et al., 2020). Recently, the application of SRL in language learning is emerging, however, limited studies focused on primary
EFL/ESL students' language learning guided by the SRL approach.

In the last four decades, educators and researchers probed the impact of digital storytelling (DST) as a pedagogy in various subject disciplines across primary, secondary, and higher education levels (Wu & Chen, 2020). DST is a technology-supported strategy for teachers to guide their students to learn a language by expressing ideas and meaning through integrating multimodal artefacts to develop language ability and communication skills (Wang & Zhan, 2010). DST has proved to be one of the most popular and effective strategies for improving students' English writing (Burke & Kafai, 2010). However, the research on innovative pedagogies or learning strategies for facilitating primary students' DST is limited. Thus, for addressing the above issues, the integration of SRL and DST, namely self-regulated digital storytelling (SRDST), will have great potential for engaging students in English learning. To fill in the research gaps, this current study attempts to address the following research questions (RQs):

- RQ1: How effective is SRDST on Scratch in supporting students in English learning?
- RQ2: In what ways and how do primary EFL/ESL students learn English writing through SRDST?
- RQ3: What are students' perceptions of the overall SRDST in the English language classroom?
- RQ4: What are teachers' perceptions of using SRDST to teach English?

2. Literature Review

2.1 Self-regulated English Language Learning Supported by ICT

Bai and his colleagues (2021) investigated the effectiveness of using SRL writing strategies to leverage primary students' English writing. They found that with e-Learning tools used, students were significantly improved in terms of employing four types of SRL writing strategies, i.e., planning, text generating, monitoring, and revising. Previous studies have been conducted to assess SRL for language learning through ICT (Şahin Kızıl & Savran, 2018). However, the majority of these studies on self-regulated learning for EFL/ESL learning have been carried out in the higher education sector or secondary education, or outside classroom settings (Yang et al.,2023; Lai & Gu, 2011) but rarely in primary classroom settings.

2.2 Digital Storytelling for English Language Learning

Previous studies revealed that DST had a positive impact on students' English learning performance, students' motivation, creativity, and critical thinking (Liu et al., 2018). However, the age group of these studies was in upper primary levels or secondary levels, and therefore, the effects on young learners in lower primary levels are still unclear. Further, some research found that learning through DST can be learner-centered to increase ESL/EFL students' learning autonomy under teachers' timely feedback and guidance (Kim, 2014). In their systematic review, Wu, and Chen (2020) found that DST yielded positive outcomes in language learning mostly in plot-based story structure, multimedia elements, and story genre. Thus, the current study will probe the effects of DST on students' grammar patterns and vocabulary learning embedded in their English writing process which was insufficiently researched.

2.3 Self-Regulated Digital Storytelling for English Writing

Writing is considered a very challenging skill for ESL/EFL learners (Bai et al., 2021; Leki et al., 2008). When writing in English, different types of SRL strategies can be employed at each of the three stages of writing, i.e. before writing, while writing and after writing (Festas et al., 2015). Previous research also asserted that the integration of computational thinking with English learning had positive impacts on

enhancing learners' motivation and academic achievement (Parsazadeh et al., 2021). Researchers believed in the learning potential by integrating formal writing practices and digital creation on Scratch and pointed out the learning possibilities in the intersection of formal writing practices taught during the school day and informal activities of digital creation (Burke & Kafai, 2010; Burke & Kafai, 2012).

3. Research Methodology

3.1 Participants and Samples

The study will deploy a mixed method approach, namely the qualitative and quantitative methods (Creswell & Creswell, 2017). A quasi-experiment research design with pre-and post-tests will be employed involving about 120 student participants, with ages ranging from 9 to 10 years old recruited from selected classes of fourth-grade students from two primary schools with similar academic backgrounds. The recruitment and assignment of participants are expected to help ensure that any differences between and within the experimental and comparison groups are not systematic at the outset of the research.

3.2 Procedure and Instruments

The research will be conducted in formal English learning activities taking place in classroom settings. Both control and experimental groups will be taught the same English topics, using the same set of textbooks, worksheets, and computers. The only difference between the two groups is whether the SRDST approach is introduced by the teachers and used by the students. The duration of the activities will be 10 hours which is the normal duration for Hong Kong primary grade 4 teachers to cover one English unit. Scratch, a widespread visual programming tool used by young learners (Resnick et al., 2009; Kong & Lai, 2021), will be adopted for the experimental group to read and create stories with multimedia elements. The experiment procedure is presented in Figure 1, and the issues to be explored, the instruments to be deployed, and statistical methods to be adopted are presented in Table 1.

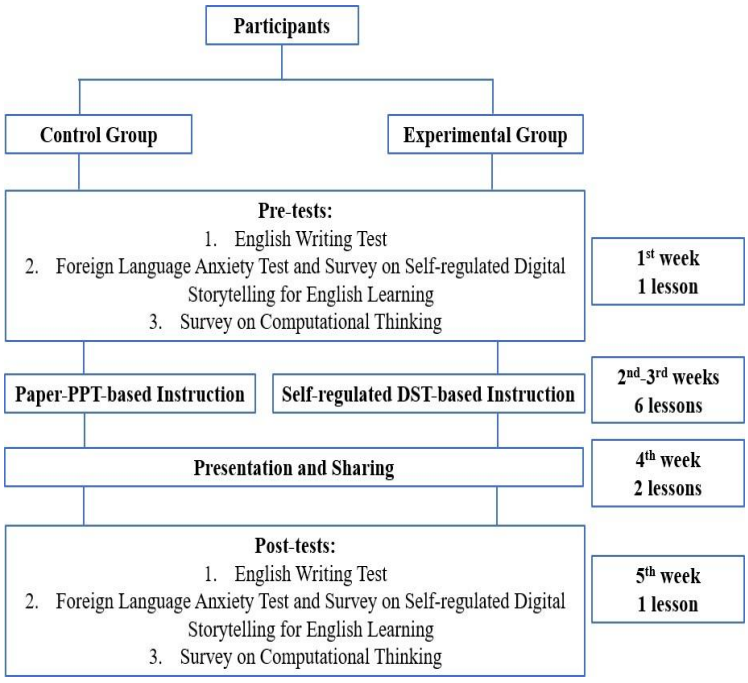

Figure 1. The experiment procedure

Table 1. *Issues to be explored, instrument to be deployed, and statistical methods to be adopted*

RQs	Issues	Instruments/ Data sources	Analysis
RQ1	Correlation among self-regulated digital storytelling	• Pre-/Post-tests of English writing • Foreign language anxiety test • Survey on SRDST • Survey on CT and UAT • Content analysis of students' works	Descriptive statistics, t-test, ANCOVA, Content analysis
RQ2	The effects of self-regulated digital storytelling on EFL/ESL students' English writing	• Pre-test and post-tests of English writing • Foreign language anxiety test • Survey on SRDST • Survey on CT and UAT • Scores of Students' works	Descriptive statistics, t-test, ANCOVA
RQ3	Students' perceptions	• Pre-test and post-tests of English writing • Foreign language anxiety test • Survey on SRDST • Survey on CT and UAT • Focus group interview	Pearson correlation, Thematic analysis
RQ4	Teachers' perceptions	• Focus group interview	Thematic analysis

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