Entertainment and Language Learning: Voice Activated Digital Game and Interactive Storytelling Trials in Singapore School

Tim Marsh, Sim Joo Jin, Chia Ching Hong

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Tim Marsh[1], Sim Joo Jin[2] and Chia Ching Hong[2]

[1]Griffith Film School, Queensland College of Art, Griffith University, Australia
t.marsh@griffith.edu.au
[2]English Language and Literature Branch, Curriculum Planning and Development Division, Ministry of Education, Singapore
{SIM_Joo_Jin, Dawn_CHIA} @moe.gov.sg

Abstract. We describe the Ministry of Education's (MOE) English Language Oracy Portal project that aims to make learning English engaging and effective through the introduction of game-based learning and interactive storytelling/storybooks incorporating automated speech-assessment-feedback mechanisms in Singapore schools. In particular, we describe pilot studies and trials with 720 students and their teachers from twelve schools, and report the most important findings to inform development to make improvements and recommend strategies for their integration in the curriculum and classroom for the final rollout in primary and secondary schools across Singapore.

Keywords: assessment, studies, trials, serious games, games for learning

1 Introduction

Game-based learning provides engaging, fun, exciting and entertaining gameplay that motivates students to learn [1, 2, 3]. Research in the field of applied linguistics also suggests that motivation is a key factor in language learning [4] and digital games have been found to possess the potential for motivating the development of speaking skills [5]. Despite English being officially designated in 1965 as the main language of instruction within the Singapore education system, Singapore's English Language Curriculum and Pedagogy Review Committee (ELCPRC) and the Ministry of Education (MOE), identified a wide range of language abilities and language use among Singaporean students and focus groups with employers revealed *"a decline in oral fluency and writing skills"* among Singaporean employees. Therefore, ELCPRC and MOE identified a need *"to ensure that every student is equipped with the English language competency and skills needed for learning, for work and for life in a global economy"*.

This paper describes one effort to address this need by introducing a gaming environment and an interactive storytelling/storybook in primary and secondary schools to motivate Singaporean students to improve their oral English Language (EL) skills. We describe pilot study trials and report on findings before rollout in schools across Singapore.

2 Studies: Pilot and Trials

720 (M, F), 480 primary school students (9-10 years) and 240 secondary school students (12-13 years) from 12 schools across a range of academic abilities took part in studies with the two interactive digital English learning applications: V.A.S.T. (Voice Activated Spy Tech) and Reading Champs, a gaming environment and interactive storybook, respectively (see figure 1). Both applications have rich graphics, animations, audio and interactive features that are comparable in many respects to commercial off-the-shelf interactive games and applications. Both applications incorporate automated speech-assessment-feedback mechanisms in four key areas: accuracy, fluency, word stress, and tone (AFWT), providing personalized guidance to help with students' individual learning needs. The rationale and aims for the EL Oracy Portal applications study trials is to:

- investigate the effectiveness of the applications, in supporting students in the development of their EL oral reading skills
- identify the factors that affect students' ability to make productive use of the feedback provided by the applications
- identify the extent that applications may be incorporated into the formal curriculum and classroom that yields the most teaching and learning value

Three data collection approaches were identified to shed light on the study's rationale and aims: (i) observation of students in classroom sessions (ii) focus group sessions with students and teachers (iii) student and teacher survey/questionnaire.

Fig. 1. Classroom trails in schools (left) with V.A.S.T. and Reading Champs (right)

2.1 Findings

Students enjoyed interacting with V.A.S.T. and Reading Champs judging by observed intonations and excitement when speaking/reading, facial expressions, and laughter. Students moved between in-game and out-of-game/storybook to discuss, collaborate and share with fellow students about in-game features, reading/speaking approaches and strategies for advancing. During this out-of-game/storybook behavior, students appeared to continue to be engaged in game/storybook-related activities. In focus groups, students verified this in-game and out-of-game collaborative behavior, and emphasized that it heightened enjoyment and contributed to learning. Teachers agreed that students enjoyed playing with applications, looked forward to lessons and were positive about collaboration between students outside of the game/storybook. In ques-

tionnaires, all students rated applications high (~4, scale 1 to 5) for fun, enjoyable, focused, and for wanting to play/read again. Male students' ratings were slightly higher than female students for mixed classes (M, F). Students' self-report ratings for learning show mid-to-high ratings. Table 1 below shows examples of the issues, concerns and recommendations identified in studies:

(i) Set-up, Integration & Tutorial: relating to support, guidance and tutorials	
1	students should be made aware and guided in the use of features through handout/tutorial provided by teachers before gameplay
2	minimize technical issues associated with sound-levels and microphone input
3	encourage acceptance/sustained use by student collaboration in-game and off-game in classroom; implement blended learning in-game / off-game
(ii) Re-Design / Re-development: generally more critical recommendations:	
4	deter students from continuously skipping through the reading/speaking tasks in V.A.S.T. and encourage more reading/speaking challenges
5	ensure students understand speech assessment feedback to make improvements to their speaking e.g. "awesome", "try again" corresponding to AFWT
6	introduce arrows, breadcrumbs, waypoints to aid navigation
7	incorporate short in-game tutorial on V.A.S.T's complex recording function
8	shift students engaged in wandering around/exploring the gaming environment to engage in missions associated with reading/speaking and learning
9	V.A.S.T.'s in-game analytics should provide clear, accurate and reliable assessments and feedback on students' speech and performance

3 Discussion and Conclusion

Studies show V.A.S.T. and Reading Champs provide appealing automated reading and speaking practice environments that are highly effective for motivating students to improve their oral EL skills in an engaging and entertaining manner. A number of recommendations have been made for their effective implementation and use towards rollout in primary and secondary schools across Singapore.

References

1. Gee, J.P.: Learning by design: games as learning machines. Interactive Educational Multimedia 8, 15–23 (2004)

2. Prensky, M.: Fun, play and games: what makes games engaging, In: Digital Game-Based Learning. McGraw-Hill (2001)

3. Marsh,T., Zhiqang, N.L., Klopfer, E., Chuang, X., Osterweil, S., Haas, J.: Fun and Learning: Blending Design and Development Dimensions in Serious Games Through Narrative and Characters. In: Serious Games and Edutainment Applications, Springer (2001)

4. Dorneyi, Z., Otto, I.: Motivation in action: a process model of L2 motivation, In: Working papers in applied linguistics, vol. 4, pp. 43-69. Thames University, London (1998)

5. Johnson, W.L.: Serious Use of a Serious Game for Language Learning, In: International Journal of Artificial Intelligence in Education, vol. 20, pp.175-195 (2010)