

The development of an online game-based simulation for the training of English language teachers in virtual environments

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Abstract. Virtual simulation training has gained in usage in various educational fields and offers the potential to support and reinforce learning goals when practical experience is not possible. Teaching practice experience in an English as a Foreign Language (EFL) classroom is critical, yet frequently unobtainable for students in Teaching English to Speakers of Other Languages (TESOL)/English Language Teaching (ELT) Masters programmes. This paper describes the design, development, and evaluation of a gamified simulation prototype, *Virtual EFL Classroom*, that was built to offer teaching practice opportunities to students in such programmes. Eleven Masters students enrolled in the ELT programme at Trinity College Dublin took part in this study. Findings indicate that participants enjoyed active experimentation in *Virtual EFL Classroom* and that it has the potential to enhance student-teachers' decision-making skills, flexibility, and adaptability in planning and teaching learner-centred lessons.

Keywords: TESOL teacher education, virtual simulation training, serious games, gamification.

1. Introduction

To date, numerous studies suggest that Serious Games (SGs) can be extremely useful for obtaining experience in disciplines where opportunities for practice are critical for skills mastery (Graafland, Schraagen, & Schijven, 2012). Considerable research has been done on the use of SGs for teacher training in general education

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(Bautista & Boone, 2015; Ferry et al., 2004; Kaufman & Ireland, 2016), but we are unaware of such research for student-teachers of EFL in TESOL/ELT Masters programmes. In this context, a simulation prototype was developed to investigate whether SGs could be useful in providing additional practical teaching experience to supplement such programmes and prepare Masters students for the needs of modern EFL classrooms. This study explores the impact of experimenting with TESOL theories and instructional approaches in a gamified virtual EFL classroom on student-teachers' adaptability and flexibility in planning and teaching learner-centred lessons.

2. Method

The gamified prototype *Virtual EFL Classroom* is designed to simulate the experience of teaching in an EFL classroom where student-teachers are given the opportunity to experiment with different instructional approaches, testing their effects on virtual-students.

2.1. Prototype design and development

Virtual EFL Classroom, built using HTML, CSS, JavaScript, and RiveScript, adopts game elements in its design. It is presented in the form of an interactive chatbot, in line with previous dialogue-based computer assisted language learning systems (Bibauw, François, & Desmet, 2019; Ní Chiaráin & Ní Chasaide, 2016) and aims to simulate real-life teacher-student interaction. A choice of images and audio (synthetic voice) prompts are included to facilitate the training process and enhance the overall experience.

Four stages of a simulated lesson are included: *opening and language presentation*, *language presentation and practice*, *language practice*, and *language production*. Each stage includes one 'Lead-in' and one 'Follow-up' activity. For each Lead-in and Follow-up, three different activity options are presented at the time (see Figure 1) and each one integrates a different instructional approach: *controlled activities* promote explicit teaching and learning from rules, *free activities* approach learning through exploration and experimentation without teacher guidance whereas Middle-Ground (MG) activities combine characteristics of both. The learning content is closely aligned to the principles and learning objectives of Cambridge CELTA, an initial qualification for those with little or no previous teaching experience (Thornbury & Watkins, 2007). CELTA learning objectives are successfully met in this simulation through MG activities only, which represent the

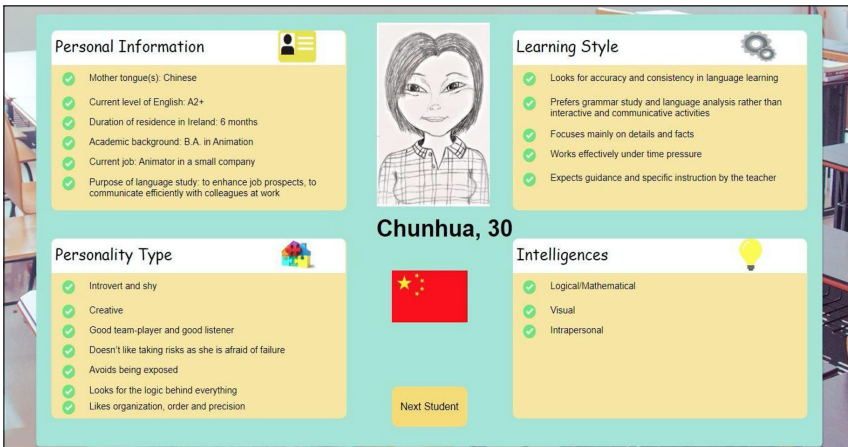
ideal path through a lesson, returning positive (green) student responses (Richards & Renandya, 2002).

Figure 1. Simulation overview



Fictional profiles were created for a class group comprising four B1-level virtual adult students. These include personal information, learning styles, personality traits, and intelligence types (see Figure 2).

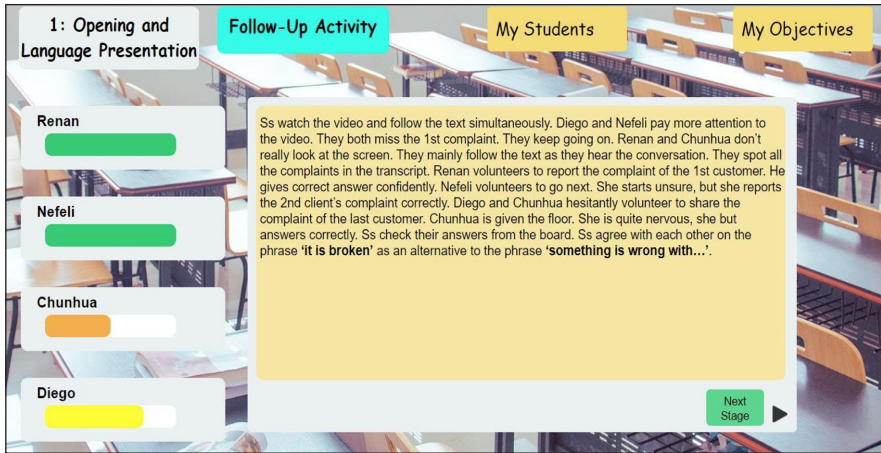
Figure 2. Sample profile for Chinese virtual-student



Real-time interaction between student-teachers and virtual-students is a core feature of the prototype. Once a student-teacher chooses an activity (see Figure 1), the

system returns a response from the class, which is predetermined in Rivescript and unique for every activity. Responses are accompanied by motivation-level bars, a ‘game’ element which gives student-teachers instant visual feedback indicating the impact of their chosen activity on individual class members (see Figure 3). Changes in motivation-level bar colour indicate the degree of fitness-for-purpose of an activity given a virtual-student’s overall learning profile.

Figure 3. Class response to chosen activity, including motivation-level bars



2.2. Prototype evaluation

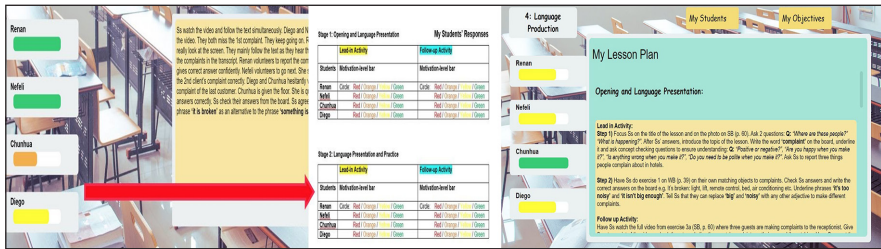
Eleven ELT MPhil.³ students from Trinity College Dublin took part in the evaluation. One virtual EFL lesson targeting speaking was selected. Participants were asked to take the role of a student-teacher and teach a lesson, consisting of eight activities, twice (Round 1 and 2). Evaluations were carried out in the Phonetics and Speech Laboratory, CLCS, over two consecutive days.

Round 1: student-teachers began by reviewing (1) virtual-students’ profiles and (2) lesson objectives. Next, they completed their Round 1 lesson, selecting their preferred route from the range of available activities. They were asked to record colour changes in their virtual-students’ motivation-level bars on a virtual-student response form.

3. Master of Philosophy

After completing Round 1, the system automatically generated a lesson plan summary, outlining the activities chosen. Student-teachers were then asked to use this lesson overview and virtual-student response form to reflect on their performance (see Figure 4).

Figure 4. Virtual-student response form and lesson plan summary



Round 2: student-teachers restarted their lesson with the same virtual-students. This was to examine whether student-teachers would change their approach and make different choices to Round 1. Again, the system generated an overview of the path taken through the lesson. Participants were given time to reflect on both rounds using the two lesson plan summaries and virtual-student response forms.

3. Results and discussion

3.1. Participants' performance

Table 1 demonstrates that nine of 11 participants used more MG activities in their Round 2 lesson. Although based on a small sample size, one can glean that the acts of reflection and self-evaluation after Round 1 played an important role in student-teachers' quest for more effective instructional approaches for their learner group (Crookall, 2010).

Table 1. Number of MG activities chosen in Round 1 and 2 of teaching practice

Participants	MG activities: Round 1	MG activities: Round 2
Student-teacher 1	2	6
Student-teacher 2*	5	2
Student-teacher 3*	3	2
Student-teacher 4	4	6
Student-teacher 5	2	4

Student-teacher 6	3	5
Student-teacher 7	1	5
Student-teacher 8	0	1
Student-teacher 9	3	5
Student-teacher 10	4	5
Student-teacher 11	2	4

2* and 3* less MG activities in Round 2, yet overall improvement

Participants' degree of willingness to experiment with different instructional approaches in order to cater for their students' needs is demonstrated in Table 2. Only one of the 11 participants left five or more activities unchanged in Round 2.

Table 2. Degree of active experimentation in Round 2

No. of unchanged activities	No. of participants
0-2	3
3-4	7
5+	1

Student-teachers' openness to experimentation together with an increase in the number of MG activities they chose in Round 2 led to a more positive outcome for the virtual-students.

3.2. Participants' feedback

Participants' feedback on the concept of virtual simulation training in general and more specifically on *Virtual EFL Classroom*, was gathered via a five point Likert scale questionnaire. Fourteen statements were included addressing game elements, user experience, and performance and user satisfaction.

To summarise, 11 participants agreed that reflection and self-evaluation informed their teaching decisions in Round 2 and led to a better experience for their virtual-students. Nine of 11 participants agreed that they did not experience stress throughout training. Ten of 11 participants felt that motivation-level bars maintained their motivation throughout and all 11 participants strongly agreed that motivation-level bars gave them a good understanding of the impact of their teaching decisions on their virtual-students and facilitated their next steps in the simulated lesson. All 11 participants agreed they would devote time to practising their teaching skills using *Virtual EFL Classroom* as they found it engaging. All 11 participants also acknowledged the potential training benefits of *Virtual EFL Classroom* for ELT M.Phil. students at Trinity College.

4. Conclusions

This study gives an insight into the potential of gamified simulated teaching practice, where real-life teaching opportunities are absent in TESOL/ELT Masters programmes. Results revealing student-teachers' increased adaptability and flexibility in their teaching decisions and positive feedback indicate *Virtual EFL Classroom* is a good foundation from which to build a serious game to support the learning objectives of such programmes and enhance student-teachers' learning and professional development. However, longer-term, larger scale research is needed.

Future development would ideally include expansion of the prototype content to include a wide range of Common European Framework of Reference for languages (CEFR) levels and language skills and the integration of immersive technology (augmented/virtual reality) to enhance engagement with the training experience.

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