Professionalization tools: impact of the game-based website 'Check your Smile' on specialized terminology acquisition

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Abstract. Computer assisted vocabulary learning, i.e. specialized terminology acquisition, is a major tool to learning Languages for Specific Purposes (LSP) necessary to students' professionalization. One current area of research is digital game-based language learning because of its motivating qualities. This paper discusses electronics students' acquisition of specific vocabulary as related to the free game-based collaborative platform Check Your Smile (CYS), which is entirely devoted to learning LSP terminology. CYS aggregates various types of games that automatically generate individualized game plays, drawing upon a collaboratively constructed multilingual dictionary. The study focuses on multiple variables including attending a selective engineering course taught in English and the language used to teach the mandatory electronics class. Empirical data shows that students having used CYS tend to obtain better vocabulary test scores than students who did not.

Keywords: serious games, terminology acquisition, English for specific purposes.

1. Introduction

Digital serious games remain a popular area of research as these learner-centered activities, similar to a language learning 'task' (Cornillie, Thorne, & Desmet, 2012), have long been considered both fun and motivating (Oblinger, 2004),

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bringing attraction to the chore of vocabulary acquisition. According to Hung et al. (2018), a learning game, often focused on vocabulary acquisition, can be defined as "a playful activity that is structured by rules for the pursuit of quantifiable outcomes (e.g. win states and points), and incorporates educational objectives (e.g. knowledge acquisition) as its own end" (p. 89). These games thus help to place learners in a positive state of mind (Papastergiou, 2009) as they actively evolve in a social dimension (Oblinger, 2004). The setting implies that mistakes are treated in a different way, while risk-taking is encouraged (Mariais, 2012, p. 48). However, according to the review by Benini and Thomas (2021), "empirical research is still limited when it comes to analyzing the effectiveness of gamification in educational and [second language acquisition] settings and practices" (p. 32).

In response to that gap, this paper examines the empirical data related to the technical English terminology acquisition by French electronics students with access to the platform CYS, which is a collaborative digital game-based language learning web platform targeting specific English vocabulary. The data covers three variables of the cohort: the participation in an optional selective engineering course taught in English, the language of the primary electronics class that may be either English or French, and finally the use or not of the CYS platform. We hypothesize that student use of serious games targeting specific lexical needs correlates with greater technical vocabulary acquisition while the addition of multiple sources of English will increase lexical acquisition. This paper is part of a larger three year quantitative (user tests) and qualitative (surveys) study analyzing the data of 441 engineering and medical students' consultations of CYS (Yassine-Diab et al., 2016).

Drawing upon a collaboratively constructed multilingual dictionary, CYS aggregates a bouquet of games. Individualized user game plays are automatically generated to target the user's field of study. The first experimentations originated following a needs' analysis in 2011-2014 for a 'Content and Language Integrated Learning' course in computing at the University Toulouse 3 – Paul Sabatier. It benefited from a French IDEX grant in 2016-2018 for increased research and development. The data presented here is from the 2016-2018 cohorts in preparation of a platform redesign and conception of a secondary premium access. It currently consists of seven games ranging from crossword puzzles to oral games requiring attention to syllable stress, as well as a collaborative dictionary organized according to academic field aimed at supporting vocabulary acquisition of English for specific purposes. For this, any user can submit a pair of new terms (word, translation and definitions), before users vote on the submission to validate or reject the entry.

2. Method

The variables examined here relate to the specificities of 248 engineering students. Among these, 39 high-performing students, called CMI[4] students, were selected to participate in an intensive engineering course taught in English. All students attended a regular English class and an electronics class, which was taught either in English (60 students) or in French (188 students), while approximately 40% of students had access to CYS.

Data was collected during a 30-minute summative evaluation (pre-test) before classes began and again at the end of the semester (post-test). The short answer evaluation questions, formulated by English and electronics teachers, included technical illustrations and instructions such as responding in a short answer to the questions 'find the band-rejection filter' or 'describe the following graph'. The objective was to determine whether students knew and could use the necessary professional English vocabulary for electronics.

The evolution between the two tests was assessed by the computation of a progression rate determined as: (post-test - pre-test) / pre-test. The resulting percentage corresponds to the difference between the two scores in relation to (divided by) the pre-test score. This median gives a central tendency indicator of progression, which tends to be robust despite potential outliers.

3. Results and discussion

Students did better on the post-test than on the pre-test as demonstrated by the median progression rates. Of the 248 students, 210 increased their score, the median rate being 45% (see Table 1, subsets do not equal 248 as only available data is used per subset). The highest progression rates are for students who used CYS and were not selected for the CMI course (52%) or whose electronics course was taught in French. The difference of progression between students attending electronics class in French and using CYS (50%) or not using CYS (29%) is notable.

Table 1. Student progression rates for various subsets

Progression Rate (S2 – S1) / S1	#	Median
Global	248	45%
CYS No	170	50%

4. CMI stands for Cursus Master en Ingénierie

CYS Yes	65	36%
Electronics in French / CYS No / CMI No	109	29%
Electronics in French / CYS Yes / CMI No	24	50%
Selective CMI No / CYS No	111	29%
Selective CMI No / CYS Yes	42	52%
Electronics in English / CYS No	19	39%
Electronics in English / CYS Yes	41	35%
Selective CMI Yes / CYS No / Elec. in English (Yes)	18	43%
Selective CMI Yes / CYS Yes / Elec. in English (Yes)	21	22%

Every CMI student (*n*=18+21 i.e. 39) attended electronics classes in English, although some students in the English-based electronics class (*n*=19+41, i.e. 60) did not attend the CMI course. Thus, there is considerable overlap of these two subsets, both of which had rates lower than the global median (45%). The combination of these two in-class variables may explain a lower global progression rate for students using CYS (36%), as these students benefited from much more intensive in-class English attention. The data on the smaller cohort of attending both CMI and electronics in English (*n*=39) is insufficient to explain the lower level of progression by CYS users (22%). Thus, CYS appears to correlate with greater gains for students with less in-class access to English.

4. Conclusions

An analysis of the empirical data demonstrates that completing activities on CYS, a serious game targeting specific lexical needs, does correlate with greater technical vocabulary acquisition, especially for students not benefiting from selective courses in English. Variables are interrelated. This suggests that vocabulary acquisition can be supported by offering multiple sources of access to English. Serious games may offer an important source for students motivated by this type of task, especially for those who do not have the opportunity to attend courses in the target language.

In the future, we intend to examine the effect of student practices such as the amount of time spent on CYS and the chosen game. Other studies have found (Hartwell, 2010) that on-line users of similar activities may avoid words that are more difficult and that time spent is not dependent on lexical knowledge. Further studies might look at the impact of time and game choice on vocabulary or language tests, be they written or oral.

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