Assessing the impact of computer-based formative evaluations in a course of English as a foreign language for undergraduate kinesiology students in Chile

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Abstract. This study assesses the impact of computer-based formative evaluations in an undergraduate English course for second semester kinesiology students at the Universidad Austral de Chile – Valdivia (UACh). The target of the course is to improve the students' online reading comprehension skills in their field. A preliminary study was carried out in order to select the platform to implement the formative evaluations. Two platforms were available: a Dokeos-based system (Dokeos, 2015), and Questionmark Perception (Questionmark-Corporation, 2015). We performed a technical review of both platforms and an empirical test in a pilot group where students' preferences were analyzed. Perception was selected since it proved to be the best choice in terms of functionality and ease of use. The target kinesiology group was divided into two subgroups, G1, and G2, of the same size and similar composition in terms of gender. Each group had the opportunity to use the computer-based formative evaluations for one half of the semester, while the other group took traditional classroom lessons in the corresponding period of time. Most students using the computer-based approach had better performance than their counterparts in the actual exam, which was taken in a paper and pencil format.

Keywords: formative evaluations, English as a foreign language, online reading comprehension, English for specific purposes.

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1. Introduction

English is the language of choice for business, science, and technology, which requires professionals in these disciplines to develop their English reading comprehension skills. We focus on English online reading comprehension, defined as the ability to read resources on a computer that offers capabilities like hypertext, access to multimedia, and web navigation. These capabilities constitute a fundamentally different medium than printed texts, offering a much richer experience to the reader, but demanding better skills to fully profit from this new media (Henry, 2005). The increase in books and texts available on the Internet has forced students to read more documents online than on paper, for which it is fundamental to develop systems to improve the development and evaluation of online reading comprehension skills.

The Faculty of Medicine (FAME) at UACh receives very heterogeneous student groups in terms of their English proficiency levels. Programs of study at FAME require students to acquire competencies to communicate in their professional area. Furthermore, the need to get accreditation for linguistic communication competencies according to international quality standards makes it necessary for students to get used to the Computer-Based Assessments (CBA) systems used in international foreign language proficiency or English for Specific Purposes (ESP) tests.

Both formative and summative evaluations at FAME are done in paper and pencil format, which involves a most time-consuming grading job for professors, reducing their available time for materials preparation and diversification of teaching strategies, also causing delays in the feedback delivery time. Motivated by these arguments, our study's objective is to determine whether the introduction of formative CBA evaluations in ESP courses have in fact a positive impact on student learning at FAME.

2. Method

2.1. Preliminary study

Objective: to select the software tool to use in our main study.

Study group: 78 graduate students from a technical English course offered to the different Master and PhD programs at UACh were used for the initial survey. 12 volunteers from that group participated in the empirical study.

Candidate platforms to implement formative evaluations:

- SIVEDUC (Sistema Virtual de Educación) based on Dokeos (2015). An evaluation development tool integrated to a Learning Management System (LMS) currently available at UACh;

- Questionmark Perception, considered for several years as one of the most complete authoring systems, which is also integrated to an LMS (Hogan & Smith, 2005; Shulman, 2005).

Table 1. Initial survey results

Characteristic of Students in the pilot group	**%**
Students owning a mobile computing device	95
Students with previous online computer based evaluation experience	23
Students that prefer taking online tests instead of paper and pencil	62
Students with previous experience that prefer taking online tests	82

Table 2. Technical evaluation comparison

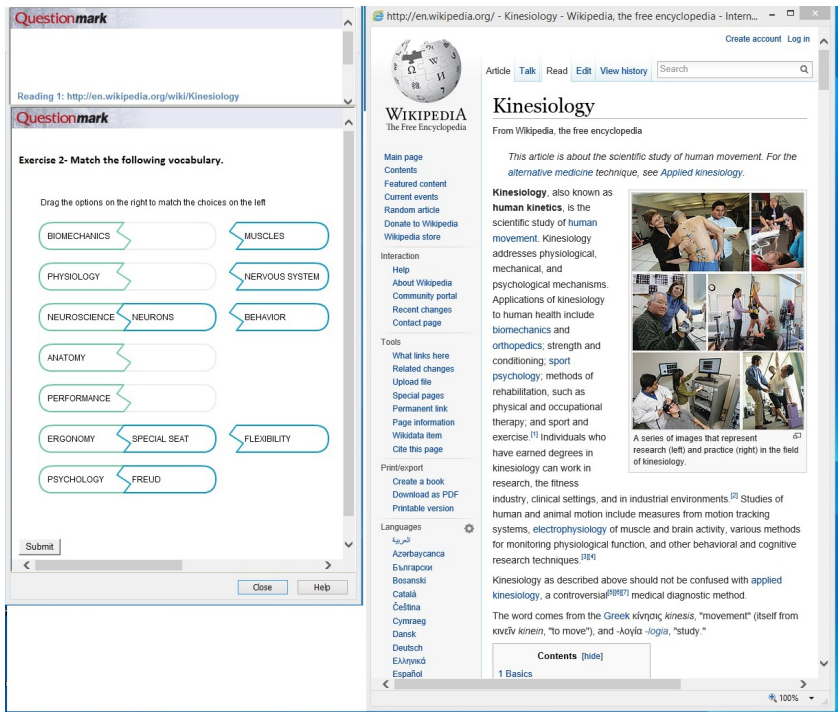
Questionmark's Perception vs SIVEDUC (dokeos based) Comparison Summary		
	Perception	**SIVEDUC**
# of Question Types	22	8
Question Type	**Developer´s Preference**	**End User's Preference**
Essay	Equal	Equal
Multiple Choice	Equal	Equal
Ranking	Perception	Perception
Column Match	Perception	Equal
Cloze	SIVEDUC	Equal
True or False	Perception	Perception

An initial survey yielded students' demographics and their attitudes and knowledge regarding the use of computer-based evaluations. This information was presented in Lazzeri, Gallardo, Cabezas & Leiva (2013). Table 1 summarizes these results, which let us conclude that the group had appropriate skills and motivation to take online formative assessments, and thus help us decide the tool to use in the main study. Afterwards, the group completed different exercises using SIVEDUC, and Perception. A final survey showed that over 70% of the students preferred Perception to answer each of the question types used: essay, multiple choice, cloze, ranking, column match, and True/False.

We also performed a technical evaluation of both platforms, comparing primarily the number of types of questions offered, and the ease of use, both from the student/user and the professor/developer's perspectives in terms of the number of actions required to carry out each task. This comparison also favored Perception, since it provided more types of questions, and, in most cases, it required less work for the developer to create and for the user to interact with the types of questions available in both systems. Table 2 summarizes these results, which led us to use Perception.

2.2. Main study

Figure 1. Sample formative evaluation: column match exercise and background material[5]



The computer-based formative evaluations were developed using Perception. The course's instructor provided the contents of the evaluations in a word processor format, then the software administrator implemented them in Perception. This

5. Screenshot reproduced with kind permission from Questionmark™

implementation was very time consuming since the ability of Perception to import word processor documents or plain text files is very limited. Occasionally, it proved useful to employ a third party software, Respondus (2015), to simplify this task, but there was still a lot of work to be done manually.

Formative evaluations consisted of one or more reading sections along with a set of exercises. Figure 1 shows a sample exercise from the first formative evaluation implemented in Questionmark. Table 3 presents the composition of the second formative evaluation used in the study.

Table 3. Composition of second formative evaluation

EXERCISE TYPE	DESCRIPTION
Technical Kinesiology Paper (pdf)	4 pages, 3047 words
Classification	25 items
Translation	20 items
Multiple Choice (4)	20 items
Cloze	10 items
Essay	10 items
Class Time	90 minute
Off Class Access	Open, Unlimited
Feedback	Correct answers to each question answered were given every time responses were submitted
Submissions allowed	Unlimited

A pilot study to determine the usefulness of the formative evalutions was conducted on the target kinesiology group, which was randomly divided into two subgroups, G1, and G2, of the same size and similar composition in terms of gender. Each group had the opportunity to use the CBA Formative Evaluations for one half of the semester, while the other group took traditional classroom lessons in the corresponding period of time. We compared the performance of the subgroups in the actual exams which took place at the end of each phase. The actual exam was graded in a 1-7 scale, with a minimum passing grade of 4.

3. Discussion

During the first half of the semester (Phase 1), G1, using CBA, obtained better grades than G2, which used a traditional approach to prepare for the corresponding exam. In the second half of the semester (Phase 2), the roles were reversed, and so were the results: G2, using CBA got the better results. In the intragroup comparison, both groups fared better when using CBA. At the individual level,

most students got better results using the CBA than attending the traditional lectures. The descriptive statistics in Table 4 show a clear trend favoring the use of CBA formative evaluations. A post-test survey showed that most students liked the CBA approach and found it useful and easy to use.

Table 4. Summary of results obtained by students in both groups

Group	PHASE 1			PHASE 2			Effect of Technology on Performance					
							Better		Worse		Equal	
	n	Mean	Sdev	n	Mean	Sdev	n	%	n	%	n	%
G1	28	5.6	0.97	28	5.29	0.739	19	68	8	28.5	1	3.5
G2	29	5.51	0.76	27	5.76	0.715	13	48	11	41	3	11
		Using CBA										

4. Conclusions

We can conclude that the CBA formative evaluations had a positive effect on learning in this context, since all intergroup and intragroup comparisons favored students using CBA, and the surveys showed that students enjoyed the CBA approach and found it useful. Individual performances show different kinds of learners: most students did better with the CBA approach, but a few got better scores with the traditional approach. A more in-depth statistical analysis of the results and surveys can be found in Lazzeri et al. (2015). Our results are only directly applicable to our particular context.

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