Make words click! Learning English vocabulary with clickers

Anne-Marie Sénécal[1], Vanessa Mezzaluna[2], and Walcir Cardoso[3]

Abstract. This study explored the effects of learner response systems (clickers) on the development of vocabulary knowledge in English (L2). Sixty-one Grade 8 learners divided in two groups participated in the experiment, which followed a pretest-posttest-delayed posttest research design. While the experimental group received a clicker-based treatment via PowerPoint presentations, the control group received identical treatment but without the clickers. Although there was no significant interaction between time and group at the time of the posttest, both groups improved over time, but with a trend favoring the Clicker Group.

Keywords: learner response systems, clickers, L2 vocabulary, L2 pedagogy.

1. Introduction

Research on the pedagogical use of learner response systems (clickers) suggests that their use may contribute to learning (Cardoso, 2011; Cutrim Schmid, 2008), and indicates that students perceive the technology as holding pedagogical benefits (Bruff, 2009; Cardoso, 2011). Most of these studies tend to be in large classrooms and involve adult participants (Cardoso, 2011; Judson & Swada, 2002). Surprisingly, the use of clickers in L2 classrooms has not received careful research consideration (Cardoso, 2011), except for a handful of studies conducted in small language learning environments (McCloskey, 2012).

Clickers are hand-held devices that wirelessly transmit student input to a computer. After creating questions using a presentation software (e.g. PowerPoint), the teacher

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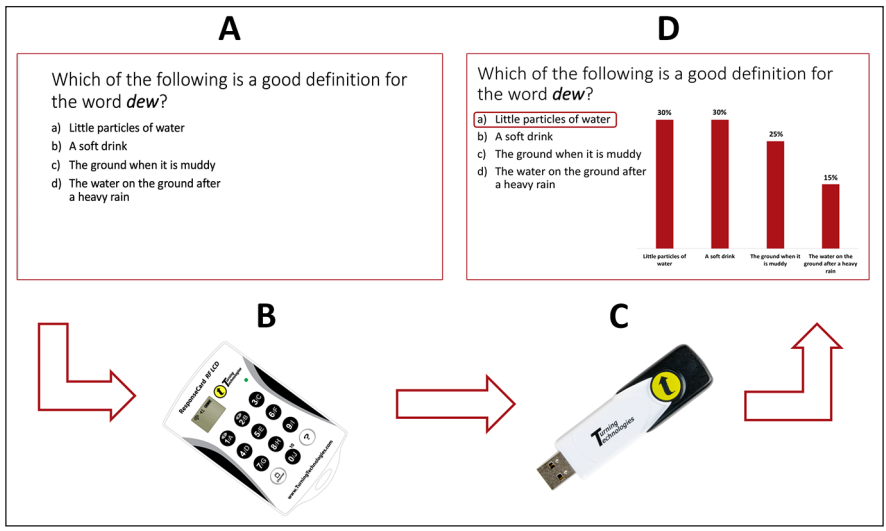
projects the questions on a board (see Figure 1-A). The students then respond by pressing the button matching their answer on their clickers (see Figure 1-B), allowing the data to be transmitted to the receiver (see Figure 1-C). When the teacher closes the polling period, the statistical results are displayed on the board (Figure 1-D) (Cardoso, 2011).

Figure 1. Clickers: method of operation (reproduced with permission from *Turning Technologies*)



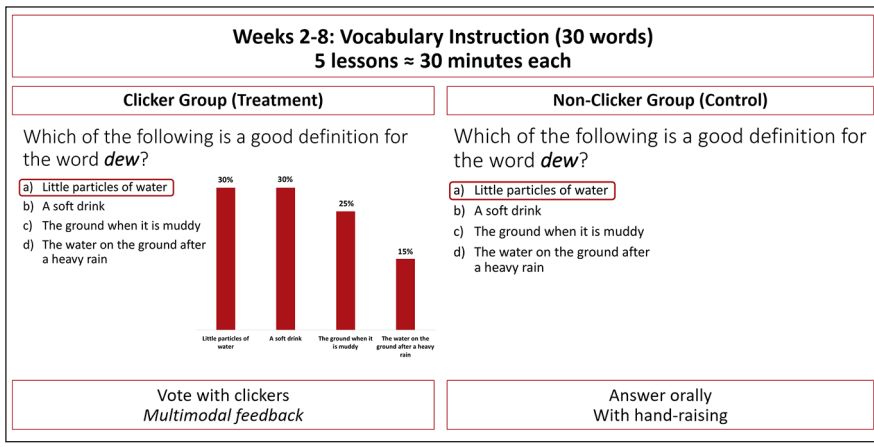
Since previous studies are not definitive as to the extent to which clickers play a role in learning gains and, in addition, they are not in the field of L2 learning, we decided to examine the pedagogical effects of clickers on the acquisition of English vocabulary (L2). Our research question was: Is the pedagogical use of clickers beneficial for the acquisition of L2 English vocabulary for secondary learners? We hypothesized that clickers would positively impact learning. Reasons for implementing clickers include their ability to foster learner interaction and a game-like learning environment (Bruff, 2009), to provide immediate feedback (Draper, Cargill, & Cutts, 2002), and to offer anonymity (Cutrim Schmid, 2008).

2. Method

The participants were 61 high-school students (Grade 8; age range: 13-14) enrolled in an ESL program in Québec (Canada). They were stratified among two groups:

(1) Clicker Group (n=31), wherein participants received a clicker-based treatment through PowerPoint presentations and were asked to vote on questions related to vocabulary; and (2) Non-Clicker Group (n=30), which received the same treatment, but without the clickers; i.e. they selected their answers via hand-raising or orally. Figure 2 illustrates how a sample activity would be conducted in the two groups.

Figure 2. A sample activity



To avoid frequency effects and familiarity with the target words, the vocabulary treatment and testing consisted of 30 low-frequency or off-list words (Nation, 2001). They were extracted from Roald Dahl's novel *James and the Giant Peach*. Participants in both groups were exposed to these words via five treatments lasting approximately 30 minutes each, over a two-month period. The study followed a pretest-posttest-delayed posttest research design where participants were asked to demonstrate their vocabulary knowledge through drawing, translation, or explanation. The pretest assessed their initial knowledge of the target words, and the two posttests assessed the amount of words learned over the duration of the experiment. One posttest was immediate while the other was conducted one month later.

3. Results

The results in Table 1 show the assessment of the students' ability to recall the 30 target vocabulary items. An independent samples *t*-test confirmed that the Clicker and Non-Clicker groups were comparable at the time of the pretest,

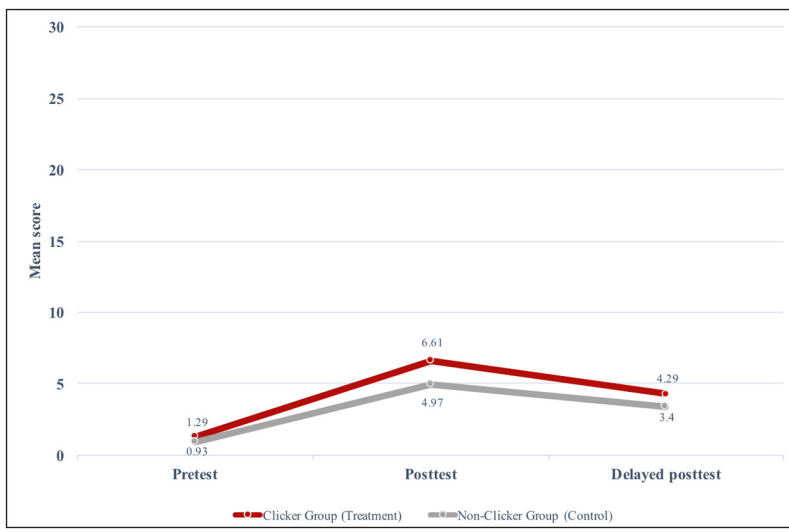
$t(59)=0.87$, $p=.39$. A mixed ANOVA was run to check for differences between the results of the groups over time (pretest, posttest, delayed-posttest). The analysis revealed a significant difference for time between the pretest and posttest, $F(1.771, 104.5)=159.53$, $p<.001$. However, there was no significant interaction between time and group, $F(1.771, 104.5)=3.031$, $p>.05$, and no significant difference for group at the time of the posttest was found, $F(1, 59)=2.78$, $p=.10$. Thus, the results show that both groups improved in their knowledge of the target vocabulary after intervention, and that there was no significant difference between the two groups.

Table 1. Descriptive statistics for the vocabulary tests

		Pretest		Posttest		Delayed posttest	
Group	**n**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Clickers	31	1.29	1.77	6.61	3.81	4.29	3.09
No clickers	30	0.93	1.39	4.97	2.31	3.40	2.08

However, a closer look at the results (Table 1) yield two interesting patterns that seem to favor the Clicker Group: (1) a trend showing its advantage on the two posttests (e.g. $M=6.61$ vs. $M=4.97$; see Figure 3); and (2) a higher SD on both posttests (e.g. $SD=3.81$ vs. $SD=2.31$; see Table 1), indicating high individual differences among the participants in the Clicker Group, thus suggesting that some participants improved more than others.

Figure 3. Vocabulary development over time



4. Discussion

We hypothesized that the following affordances of clickers would lead to higher vocabulary acquisition: their interactive and game-like approach (Bruff, 2009), immediate and continuing feedback allowing for self-evaluation (Draper et al., 2002), and their anonymity (Cutrim Schmid, 2008). However, our results show that clickers had limited pedagogical value in terms of aiding vocabulary acquisition in comparison with the group not using clickers. We emphasize the term *limited pedagogical value* because we found evidence that clickers may be beneficial for some, possibly due to individual differences and/or learning styles. The disparities in performance suggest that clickers' pedagogical benefits may be affected by individual differences. Finally, we can observe a developmental trend that favored the Clicker Group over the other group, over the two testing periods. Possibly because of higher standard deviations (particularly within the Clicker Group), those differences were not deemed significant by the statistical analyses.

An interesting pattern surfaced in our analysis: a relative decline in the number of acquired words on the delayed posttest, which was observed for both groups. It is possible that this decline (or 'unlearning') is due to the inclusion of rare and off-list words. This may have occurred since the students were not exposed to the words a sufficient number of times, either in or out of class. According to Cobb (2007), six to ten meaningful encounters with a vocabulary item is the minimum necessary for the item to have a potential to be acquired. In our study, the vast majority of the target words were only used in the context of the classroom (e.g. rambunctious, to beckon), thus diminishing their potential to constitute learnable words, as per Cobb's (2007) recommendation. In future studies, we will ensure that participants are sufficiently exposed to the target vocabulary items to optimize their ability to learn the words. Since it is also possible that the use of low-frequency and off-list words compromised the motivation of the students, causing some to question the meaningfulness of the lessons, a different subset of words could be used.

5. Conclusion

Despite the lack of significance observed in clicker-based instruction for the development of L2 vocabulary in English, we believe that clickers have potential for use in the L2 classroom, not only because of the evidence discussed above, but also because students feel they are more motivated to learn and believe they learn more words. In a survey administered to participants in both groups at the end of the study, the students in the Clicker Group significantly outranked their

Non-Clicker counterparts when asked to rate their perceptions of how motivated they were to learn vocabulary and, more importantly, how much they believed they learned. These are very optimistic results that will be addressed in a future study.

Previous research investigating the pedagogical benefits of clickers suggests that their use may contribute to learning (Cardoso, 2011; Cutrim Schmid, 2008). However, most studies are not definitive in their findings. Given that the results of this research follow the trend, more research is needed to ascertain the pedagogical benefits of clickers in second language learning.

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