

PLICKERS AND THE PEDAGOGICAL PRACTICALITY OF FAST FORMATIVE ASSESSMENT

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Abstract

Student Response Systems (SRS) can provide effective, immediate, and efficient feedback to students, particularly when undertaking formative assessment. Coupled with active learning approaches, the use of such systems can be beneficial for English language learners by providing opportunities for increased engagement with content and reflection on their knowledge gaps. These opportunities can then potentially lead to increased learner participation, motivation, and linguistic skill development. As an SRS system, the pedagogical practicality of using and developing content with the *Plickers* application is reviewed, with features of the application presented in detail. Methods of applying the application, determining how it aligns with technological frameworks, and presenting the potential of the application for use in the language teaching context are also presented. Ultimately as a tool that can be used to engage students of all ages in formative assessment, it is unique in that it can do this by taking technology out of learner hands while simultaneously assessing all students at once.

Keywords: mobile-assisted language learning; formative assessment; *Plickers*

Application Details

Publisher: *Plickers*

Product type: Web and Android/iOS applications

Language(s): English (website/app), Variable (question text)

Level: Any

Media Format: Image/text

Operating systems: Any smartphone that can run the app, active connection to the Internet if using the website in conjunction with the app (not required)

Hardware requirements: Smartphone (iOS/Android), Internet connection (if using the website)

Supplementary requirements: paper-based QR codes for each student (free to print, laminated cards available for purchase)

Price: Free (app/website), paid/free (laminated/downloadable QR cards)

1. Introduction

When teaching English as a foreign or second language (EFL/ESL), one of the biggest challenges for instructors is that of motivating and engaging learners (Niederhauser, 1993; Lee & Oh, 2014). So too, in recent years, large ‘conversation’ classes of 40-60 students are becoming the norm (Chetchumlong, 2010), coupled with often limited access to in-class technology, and learners that have a fear of being wrong or are too shy to respond to questions asked of them (Mula & Kavanagh, 2009; Wong, 2016), all leading to difficulties for students in terms of being able to attain adequate language practice, and in receiving prompt feedback from instructors. This is often coupled with environments where practitioners are inhibited by administrative procedures or classroom contexts that hamper the effectiveness of their instruction, and again, all leading to less time for student-teacher interaction and the provision of timely and adequate feedback. As such, administrators, educators, and researchers need to look for ways around these issues – a new and unique way being the innovative implementation of student response systems (SRS) such as *Plickers* (www.plickers.com).

SRSs have long been available to educators and used in ways that fundamentally enhance engagement with learning content by supporting the instructional process (Espey & Brindle, 2010) by providing efficient, effective, and immediate feedback to assist in guiding students with their learning (Crossgrove & Curran 2008). However, as Kim, Al-Mubaid, Yue, and Rizk (2011) note, it is the use of active learning approaches (e.g., group work, discussion, and collaboration) that leads to learning gains when employing an SRS. Active learning principles, sustained by the use of Communicative Language Teaching (CLT) and constructivist methods, have long been at the center of TESOL classes (Monk, 2014). One way of using this method and approach when implementing an SRS sees that students need to work with each other to identify relationships between new information while using prior knowledge to help them reach a conclusion, and that in turn leads to increased comprehension skills, opinion sharing, participation and student-teacher interaction (Lee & Oh, 2014; Yoon, 2017). Espey and Brindle (2010) also note that when learners use an SRS, they can reflect upon peer mistakes and retain more of what they study. Other research supporting SRS use in the classroom shows that it can lead to increased student satisfaction (Hung, 2017), participation (Cordoso, 2011), motivation (Yu & Yu, 2016), vocabulary development (Yu, 2014), and communicative competence (Agbatogun, 2014). Further, research employing the *Plickers* SRS specifically (Kent, 2019) illustrates that it can stimulate active learning, highlight student knowledge gaps, focus learner attention, and encourage engagement with content through formative assessment. Indeed, the most significant implementation of an SRS in the educational context is for

formative assessment (Espey & Brindle, 2010). This kind of assessment in the EFL classroom is something that can help engage students with the learning process and assist them in developing mastery of skills (Premkumar, 2016), and this is something that teachers can use the *Plickers* application to provide (Kilickaya, 2017; Krause, O'Neil & Dauenhauer, 2017).

The purpose of this review, then, is to highlight the means of developing pedagogical content with the *Plickers* application, explaining how to use it with students for formative assessment purposes, and to illustrate the features of the application in detail. In this way, the potential of the application for use in the English as a foreign/second language teaching context is presented, along with the method for how it can be used to engage students in the learning process. The paper also goes beyond other reviews, such as Kilickaya (2017) and Krause, O'Neil, and Dauenhauer (2017), by considering how the application aligns with the substitution, augmentation, modification, redefinition (SAMR) model (Puentedura, 2009) while illustrating how the tool can be applied to provide instantaneous formative assessment while taking technology out of student hands.

2. Description

Paper clickers, or *Plickers*, is a free student response system (SRS) that uses quick response (QR) codes printed on paper for use as a paper clicker (see Figure 1). In this case, each side of the QR code corresponds to one of four options depending on how the card is oriented (A, B, C, or D), with each card assigned a unique number (1-63) for each student. These cards are available for purchase (laminated in packs of 40), or are freely available to print from the website in various sizes and quantities, with the larger cards easy for young learners to handle.

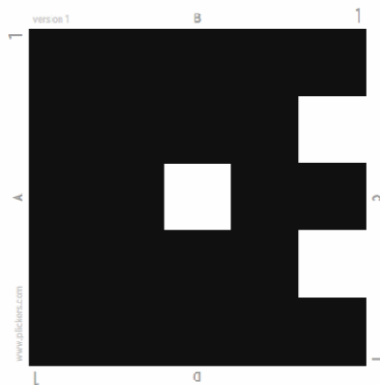


Figure 1. Sample *Plickers* card

To date, QR codes have been used in EFL settings to great effect (Kent & Jones, 2012a), improving motivation, and allowing for the integration of various technologies into the classroom alongside the practice of language content (Kent & Jones, 2012b). An advantage to this app is that, in a minimum-use setting, an instructor-held smartphone or tablet and a paper-based handout per student are all that are required for the SRS to be effective. Responses can also be displayed in real time, using the *Plickers* LiveView option from the website, and if Wi-Fi and a computer with beam projector are available, feedback and discussion on each item can then be conducted easily on-the-fly.

2.1. Pre-class

2.1.1. App and website preparation

Prior to using the *Plickers* app with students, the teacher needs to install the application on their smartphone/tablet (iOS/Android), and then, using the *Plickers* website or application (after registering), create a class (see Figure 2) and assign students to virtual cards (matching the physical ones that they will later use in class; see Figure 3). Classes of up to 63 students can be handled, with student details typed in or entered by cutting and pasting a class roster. Cards are assigned based on student order, so the first student on the roll sheet will need to use *Plickers* card one. Classes can be edited, archived, or deleted from the main page as necessary, but at this time, there is no way to add classes or students from within the app. However, the website and app both provide access to the question library and classes, with the app providing a question history with the website providing reports, access to LiveView (discussed later), cards to print for free, and a comprehensive help section.

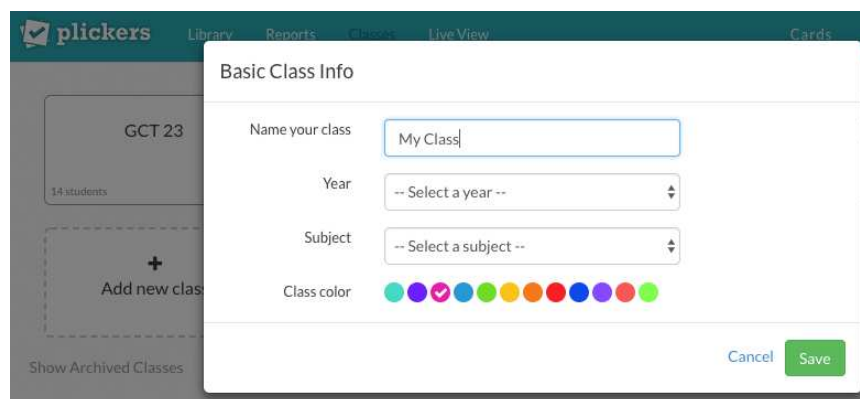


Figure 2. Adding a class on the website

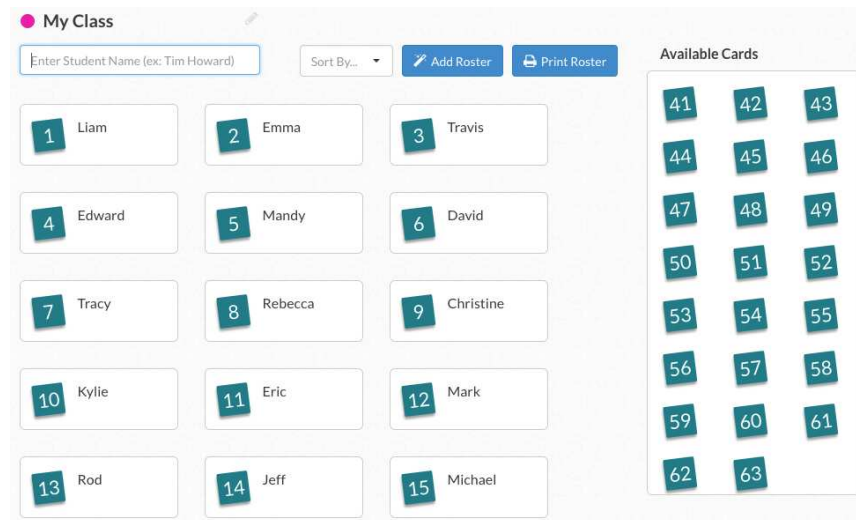


Figure 3. Assigning students to cards

2.1.2. Question design

After classes are created and students assigned to cards, it is time to add questions, and this is done by clicking on 'Library' and 'New Question' (see Figure 4).

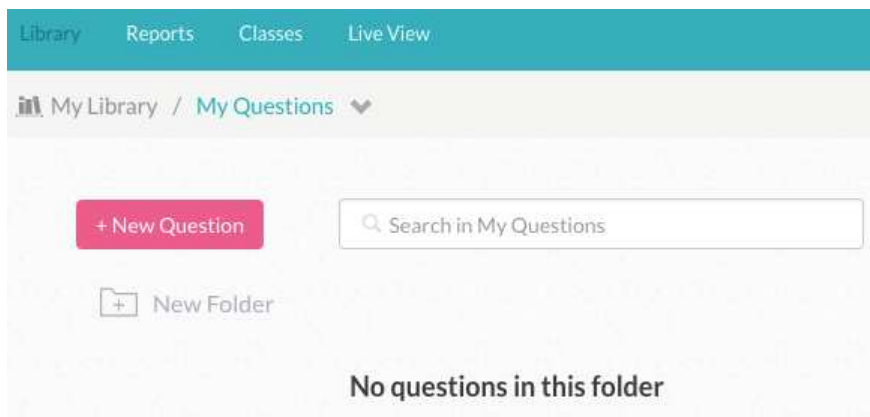


Figure 4. Adding a question

Text, images, or a combination of both, can be added to the question text, and any language can be used for this purpose. Answers can be multiple-choice or true/false (yes/no) with a correct answer set, or left unselected if conducting a survey or poll (see Figure 5a). Up to four answer options can be provided. Questions can also be created from within the app by selecting the class that the question will be used with, and populating the fields in the same manner as the website (see Figure 5b). The application can also utilize the smartphone/tablet camera and

photo library to insert images into questions directly. After being entered, questions can then be edited, moved, un/archived or deleted. Question reports are available from here, as well as the ability to assign the question to a class using 'Add to Queue' (see Figure 5c). Once questions are assigned to a class or a list, they are ready to be used in the classroom in conjunction with the teacher-held smartphone/tablet (with app installed) and the student-held cards. The order of the questions can also be rearranged at this time, either from website or app, or chosen at random during in-class time.

Figure 5a. Entering questions (website)

Figure 5b. Entering questions (iPhone app)

Figure 5c. Example question list (website)

2.2. In-class

2.2.1. Scanning and recording responses

During class, the app alone can be used with paper-based handouts or questions from a textbook, with the app collecting student responses and showing details to the teacher, or it can be used in conjunction with LiveView from the *Plickers* website. If using LiveView, questions are displayed on a screen for all students to see (as in Figure 6a), with the question displayed on the smartphone/tablet as in Figure 6b. When the teacher is ready to scan student responses, the 'Scan Now' button is pressed and with the smartphone/tablet held vertically, a sweeping motion across the room is used for the camera to record responses.

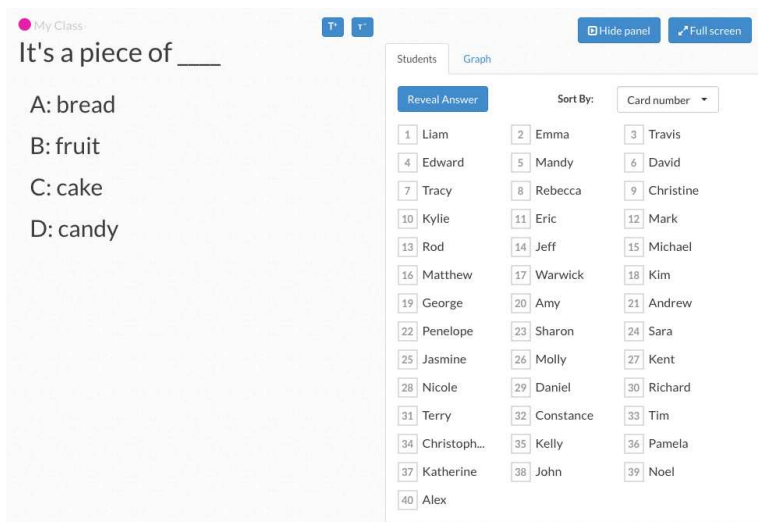


Figure 6a. Question display (LiveView)

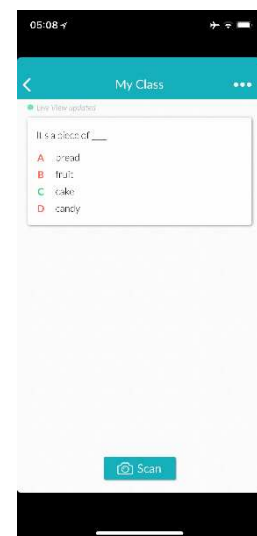


Figure 6b. Question display (app)

After scanning the room, student answers are displayed in real time on the smartphone/tablet display (see Figure 7a). Information presented includes number of correct (green) and incorrect (red) responses, total cards scanned, and showing those not scanned (gray). Individual question responses can also be cleared at this stage if responses need to be rescanned for any reason, or saved before proceeding to the next question.

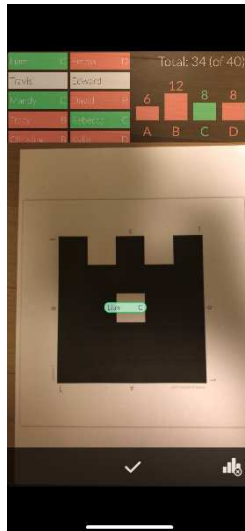


Figure 7a. Scanned question view (app)

Once a card has been scanned, the LiveView card number changes to a tick, assisting both teacher and students in knowing if all cards have been scanned (see Figure 7b). The 'Reveal Answers' option is available to disclose hidden responses (with incorrect options displayed in red, correct in green) if desired.

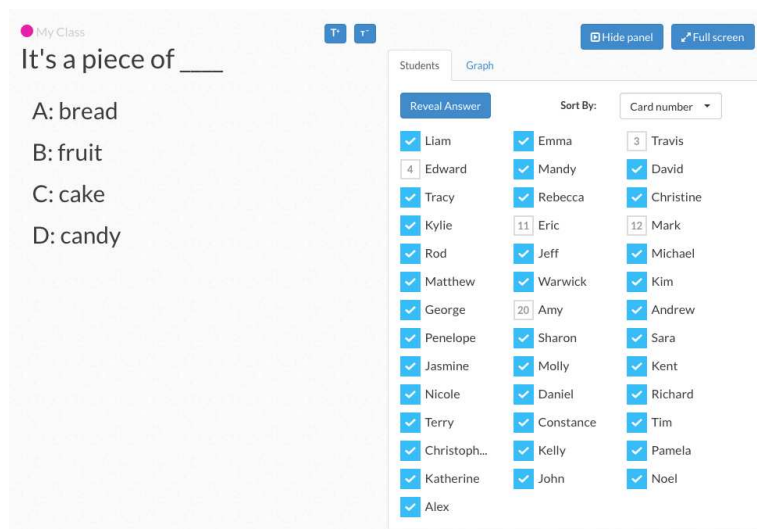


Figure 7b. Cards scanned, hidden responses, question view (LiveView)

There is also an option to show student responses anonymously as a graph initially, and then with the correct responses (see Figures 7c). A similar screen is also displayed on the smartphone/tablet (see Figure 7d).

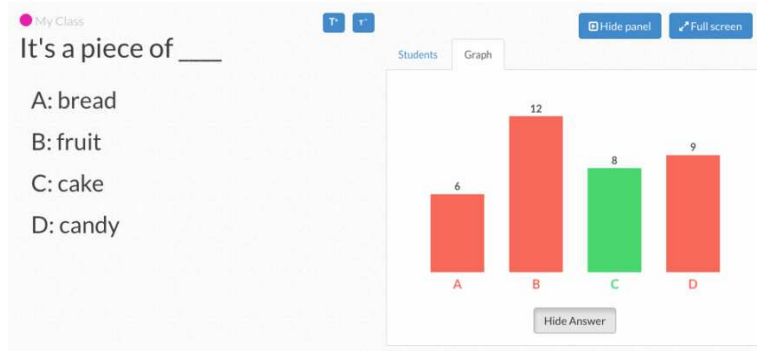


Figure 7c. Answer response graph with correct answer (LiveView)

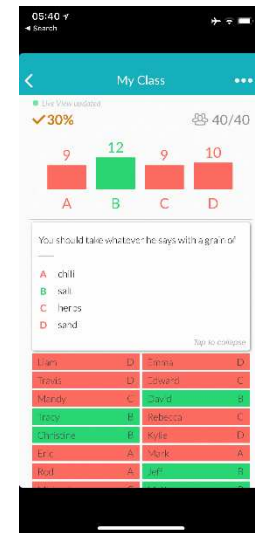


Figure 7d. Post-scan graph (app)

Depending on how the questions are being used, a discussion can then occur revolving around response choices and the merits of each, or the next question can be displayed and answers scanned in the same manner as described above until all questions set for the task have been completed.

2.3. Post-class

2.3.1. Accessing student response data

All student response data are available from the website through the reports section and can be filtered by class and by date, with access to data for individual questions (see Figure 8a) indicating correct and incorrect answers, individual student responses, and the percentage of the class responding correctly. Also available is a scoresheet for an entire class that shows, for any given date range, the total number of questions that the class has responded to, individual student responses to each question, the overall percentage of correct responses per question and in total, and a running percent total for each student regarding all questions that they have responded to (see Figure 8b). Individual questions can also be excluded from the totals if necessary by unchecking the box above each, or examined in detail by clicking the title to open a panel to the right of the scoresheet which also links to individual question data from the report section. These data can be printed, or exported for grading or offline archiving purposes.

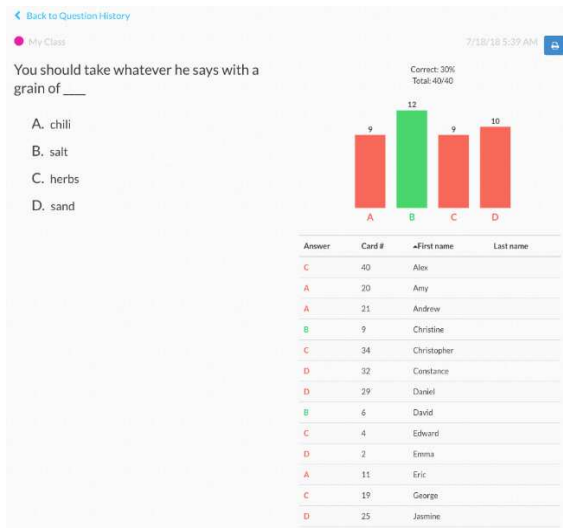


Figure 8a. Report data for individual questions

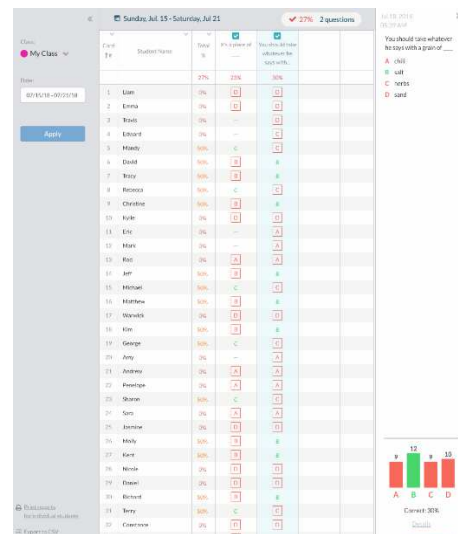


Figure 8b. Scoresheet for a class

3. Evaluation

Ultimately, using *Plickers* to deliver and inform upon the teaching and learning process using formative (low-stakes) assessment is the strength of the application (Kilickaya, 2017), with this kind of assessment referring to a wide variety of in-process checks of student comprehension, learning needs, and academic progress throughout lessons, plus units of study and courses (Dodge, 2009).

Plickers also excels at allowing teachers to engage even the shiest students in classroom activities, allowing those reluctant to respond in normal classroom discussions to contribute anonymously (if desired) while engaging with content, classmates, and the instructor interactively. The application also provides teachers with a means to allow learners to undertake assessment in a way that is less intimidating and anxiety-promoting than those provided in a summative, traditional, or a paper-and-pencil-based manner. In this regard, it is an app that addresses one of the most critical needs of teachers: rapid identification of learner progress. Instant checks for understanding, in turn, identify those students who require additional support or may be experiencing challenges, allowing teachers to decide which students to then assign to others during pair/group work by tying stronger learners to weaker ones.

Flexibility for teachers to craft their own question content for delivery, although limited to four-option choices, provides for the import of questions and graphics from student-assigned content, as well as allowing teachers to craft tailored questions that can encourage analysis, inquiry and target language practice. This may initially be time-consuming, as questions are

entered one at a time, but questions are reusable and adaptable. This potentially allows for a variety of uses across a range of classes, including developing polls on hobbies or favorite things for use with low-level conversation classes; pop-quizzes for review or as a summary for all levels that might also offer practice for sentence structure and vocabulary; and presenting content-based questions for English for specific purpose classes that check on both the understanding of big concepts and the mastery of skills.

The customization inherent in the *Plickers* app allows any use of it to align with the TPACK framework on an individual level. This is where the use of digital tools in the classroom (technical knowledge) crosses over with the method and practice of teaching (pedagogical knowledge) to present and ensure learning from material being taught (content knowledge), with the relationship between these three areas producing different classroom dynamics to traditional instruction, and from which effective teaching with technology can emerge (Koehler & Mishra, 2009), particularly when considering the SAMR model of classroom technology integration (Puentedura, 2009), to which *Plickers* aligns very well:

Substitution – *Plickers* replaces paper-and-pencil formative assessment tasks, and is more interactive and engaging than having students raise hands or indicate a thumbs-up/down to provide responses, offering anonymity in the process.

Augmentation – both teacher and student are immediately aware of recorded responses and, if desired, whether that response is correct or incorrect.

Modification – Teachers and students are able to visualize answers in real time, and react accordingly. Teachers can then holistically discuss responses by sharing responses anonymously, and without revealing the correct answer, allow students to rethink and revise responses.

Redefinition – All students can participate simultaneously, as opposed to calling on students to provide answers individually which at times may see some learners unable to participate at all. Teachers can also use the app to ask questions anytime during a lesson, recording answers that can instantly inform on the direction of instruction.

As the app relies on laminated or printed cards that are scanned by a single smartphone/tablet, this can be less intimidating for technology-challenged teachers or those new to teaching with technology, and this allows teachers to focus more on teaching than on setting up. Also, the use of a single device in conjunction with the app, combined with verbal or paper-delivered questions, is all that is required if technology is lacking in the classroom, and this is just as easily performed as using the app alongside the *Plickers* LiveView website if technology is available. The smartphone/tablet can also save student-response data for teachers

to analyze later from the device itself, or from the website once an Internet connection is established. As such, there is no reliance on individual learners to possess or be provided with equipment that might be forgotten, dead, or which the student does not know how to operate, all of which can lead to lesson and classroom disruption, particularly if there is a need to deliver 40-63 individual clickers to students or for using the same number of smartphone/tablets in the classroom. Of course, as with any technology use, contingency plans are a must in case the teacher's device fails.

The laminated cards that can be purchased from sites like Amazon allow for plentiful reuse, but if lost, can be freely printed. They also make it easy for all levels and ages of students to grasp the concept of providing answers, as cards are simply rotated to the appropriate orientation, and if teachers/students wish, responses can be hidden from peers. Cards are also compact and light enough for teachers to carry in their everyday toolkit, with questions and polls easily created on the fly if required. One issue here, though, is that teachers need to ensure that each student gets the correct card, and using roll sheet order might be the best way to assign cards, particularly since, in terms of privacy, no student information is actually required by the app or website. Teachers may also need to practice scanning techniques with challenges stemming from students shaking their cards, holding them at low angles, getting glare from lights, or if a student is blocking another in a cramped classroom. Further, students also need to be sure that they are holding their cards with their chosen response at the top in order to avoid erroneous scans.

Although designed to be used with one card per student, this can be adapted with a card assigned to pairs or groups to encourage discussion amongst students or teamwork activities, with responses scanned once members have talked through a response. This would allow for the development and inclusion of collaborative learning activities where students work in groups or pairs to develop and demonstrate understanding of content and concepts (Warschauer, 2011), from which instruction can be modified in real time through question choices as the activity is conducted. The report data that is collected after scanning also easily allows teachers to go back and identify where a learner has performed poorly, indicating overall knowledge gaps, as well as being able to identify on a whole-class level where learners lack knowledge. Here, *Plickers* use solves the difficulty associated with a teacher trying to perform such a task by simply monitoring students as they complete in-class tasks, or when going around the room interacting with individuals, pairs, or groups on a more personal level as they practice their language skills.

4. Recommendation

A major benefit of *Plickers* is that it sees minimal to no expenditure from the instructor or institution (Taylor, 2016). As an SRS, it is unique in that there is no special equipment to use or maintain, nor do students need to comprehend or use new technical systems or download any apps (Lam, Wong, Mohan, Xu & Lam, 2011). In contexts where class hours are limited, this facilitates fast and easy setup, allows for ease of employability with small to large classes (either housed in big lecture halls or crammed into closet-sized classrooms), and it can do so in a way where the focus remains on class content. It also provides increased instructor autonomy over technology and the learner content being delivered, and wrestles technology away from the student.

Overall, the app is pedagogically adaptable to a range of formative assessment types, classroom polls, and review tasks, while also proving to be worthwhile as an exit ticket for lessons. As an app effortlessly added to the arsenal of every 21st century language teacher, it can help students easily and quickly understand what they caught from what was taught, while simultaneously providing instructors with snapshots of learner understanding from which they can identify student needs and knowledge gaps that can then be actioned upon in real time or during follow up lessons.

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