

iPads in teacher education: integrating a range of language learning knowledges through a technological medium

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Abstract

In this article we will describe a study examining the responses of a small number of pre-service teachers to four language-learning iPad apps. The teachers' responses are analysed in terms of how the apps could be used for language learning in the classroom. These findings will be discussed in light of recent language teaching and learning theory and in support of a critical survey of language learning apps. Implications for the use of iPad apps in teacher education relating to language teaching, and to the classroom use of iPad devices, are considered.

Introduction

We teach a compulsory course to second-year undergraduate pre-service primary teachers entitled Working with Cultural and Linguistic Diversity (WCLD). The course includes a strong focus on support for learners of English as an additional language (EAL) to fully participate in the English-medium classroom, and on the promotion of learning other modern and foreign languages (MFL) as a vehicle for language and intercultural awareness. Along with attention to principles of educational equity, inclusiveness and cultural responsiveness, the course presents an overview of pedagogical approaches to language education.

This year we became interested in the burgeoning use of mobile technologies in schools and how apps could provide new, rich and varied resources to enhance language learning in the classroom. When we learned that iPads were available in our faculty for research, we took the opportunity to investigate how our students in WCLD would respond to the use of specific iPad apps in their future work as teachers of diverse students in mainstream primary settings. Our research project, then, focused on the following question:

How do pre-service teachers perceive selected iPad apps might be useful in effective teaching (both EAL and MFL) in primary settings?

We hoped that the answers to this question could guide us as teacher educators to promote teachers' working with cultural and linguistic diversity in an increasingly technological environment.

Theoretical framework

Digital media is not new to language education. Since the mid 1990s research concerning mobile-assisted language learning (MALL) has explored the use of mobile devices such as iPads, iPods and mobile phones in the process of language learning (Li & Hegelheimer, 2013). For several decades though, CALL (computer assisted language learning), has played a well-established role in language pedagogy, largely underpinned by theoretical trends in second-language acquisition theory (Gruba, 2004). We concur that theories about language and language learning are key considerations in teaching through technological media. Thus we would like to start by briefly reviewing these. Two predominant questions drive research and theorising in additional language learning: 1) What does competent language use look like? and 2) how are languages learned? The discipline's responses to these questions influence pedagogical developments in the classroom.

First, the early 1970s saw the development of theories of communicative competence, drawing on Dell Hymes' work in sociolinguistics. Communicative competence differed from the prevailing notion that proficient language use was reflected in linguistically correct sentences. Rather, it went beyond the sentence and included an ability to use

language appropriately in different situations for different purposes, with different people and to negotiate communicative difficulties (Richards, 2006). This development led to the communicative language teaching approach, where skills were integrated; authentic materials were favoured over contrived drills; errors were considered part of learning; language form was taught in meaningful contexts; and students engaged in interactive tasks involving real communication in the classroom. The communicative language teaching approach remains predominant currently.

Second, in the late 1990s sociocultural theories of learning became more influential in language education (e.g., see Pavlenko & Lantolf, 2000, and Swain & Deters, 2007). These theories drew on Vygotskian notions of learning based on interaction guided by more capable others and on related theoretical concepts of situated learning through participation in communities of practice (e.g., Lave & Wenger, 1991; Rogoff, 1999), rather than learning through direct, decontextualised instruction. In other words, language learning is seen as predominantly a social phenomenon, not a form of isolated individual mastery. In teaching, these views have reinforced interactive task-based classroom activities as well as highlighted the importance of language learners' meaningful participation in target language communities. The recognition of the social element in language learning, however, does not negate the concept of individual cognition. Despite an early debate in the literature, Anna Sfard's 1998 article made clear the important roles of both individual cognition and social participation in learning.

But what does this language learning theory mean in the context of the classroom? As the result of an extensive literature review of the plethora of research concerning effective instruction in second language acquisition, Ellis (2005) published a set of ten principles to guide language teachers. These have received much attention in New Zealand language teaching circles (e.g., Erlam and Sakui, 2005), and they are promoted on the Ministry of Education website Te Kete Ipurangi (<http://seniorsecondary.tki.org.nz/Learning-languages/Pedagogy/Principles-and-actions>). Overall Ellis' principles align with the key features of communicative language teaching. However, because Ellis' principles focus on *instructed* language learning, there is no mention of the importance of participation in communities of practice. Ellis' Principle 8 is explained as opportunities to interact in the target language, but in second

language pedagogical practice, this is often manifested as carefully designed interactive tasks, which is not necessarily the same as participation. For EAL students in a mainstreamed school context, participation in English-speaking classroom life is vital to their sense of belonging and their language development.

MALL has been defined as the “use of personal, portable devices that enable new ways of learning emphasising continuity or spontaneity of access and interactions across different contexts of use” (Kukulshka-Hume & Shield, 2000, cited in Li and Hegelheimer, 2013, p. 138). Recently a special issue of *Language Learning and Technology* (Sotillo & Stockwell, 2013) has published a series of studies examining MALL, mainly in American tertiary contexts, and predominantly with a focus on the devices themselves. Findings concerning the use of iPads and mobile phones in both EAL (e.g., Daesang, Rueckert, Dong-Jong, & Daeyong, 2013; Wang & Smith, 2013) and MFL contexts (e.g., Lys, 2013) show that this way of learning is perceived favourably by the participants. Li and Hegelheimer (2013) examined the use of a web-based app they had developed called Grammar Clinic by EAL learners. Once again, the findings showed that the app was regarded as beneficial by learners.

Of course there is also MALL research based in primary and secondary settings for EAL students (e.g., Patten & Craig, 2007; Lacina, 2008), and for students needing extra assistance with literacy skills (e.g., McClanahan, Williams, Kennedy & Tate, 2012). In a New Zealand context, there appears to be little published research focused specifically on MALL; however, there is some research exploring the use of mobile devices in primary (e.g., Falloon, Janson & Janson, 2010) and secondary settings (Wright, 2011) with regard to education across the curriculum.

The conceptual framework TPACK, an acronym that “stands for Technology, Pedagogy, and Content Knowledge” (Voogt et al., 2013, p.109), identifies an important approach for understanding how technology figures in teachers’ work (e.g., Mishra & Koehler, 2006; Voogt, Fisser, Roblin, Tondeur, & van Braak, 2013). This concept builds on Shulman’s earlier theory that highlighted the importance of teachers’ pedagogical content knowledge, that is, “a blending of content and pedagogy into an understanding of how particular topics, problems or issues are organised, represented and adapted to

the diverse interests and abilities of learners, and presented for instruction” (Shulman, 1987, p. 8). Technological knowledge, an understanding of the use of emerging technologies, is now seen as an essential addition to teachers’ knowledge in current times of rapidly changing, expanding technologies. Technological pedagogical content knowledge refers to an integration of these components of knowledge in teaching.

The research described in this article is small and exploratory, but nevertheless aims to address the area of MALL in a New Zealand context, focusing on undergraduate primary teacher education and the use of specific apps relating to language learning. We also aim to link our findings to language learning theory more closely than many previous MALL studies.

Method

There were two phases in this project. Firstly we surveyed and chose suitable apps, and then the chosen apps were presented to pre-service teachers to explore and comment upon via a written questionnaire. Our initial survey focused on language learning apps that met our criteria as appropriate for children, with very low or no cost (considering limited school budgets), user-friendly design, and evidence of at least some language learning principles identified by the Ministry of Education in Ellis (2005). The scope of our search included various catalogued lists of apps recommended by colleagues and/or identified by Google searches for primary language apps.

Judy categorised the English language learning apps according to their underlying approach to language learning. She observed that apps tended to do one of two things: 1) promote decontextualised language form and skills or 2) facilitate creative participation in the English speaking classroom community. A large number of apps presented vocabulary items, spelling, and pronunciation. They were generally not linked to authentic communication, but presented in game formats with scored competitions, animated graphics, timers and sound. The second group allowed students to create multimodal texts. They incorporated various combinations of drawing, print, photos, animation, sound, voice recording, and sharing. These apps facilitated flexible modes of participation in learning activities and personalised learning design (Wright & Falloon, 2012; Yapp, 2012). Nicola found that the range of language learning apps for foreign

languages ranged from those which taught vocabulary and phrases to those which taught non-Latin script. From this range of language learning apps, Judy and Nicola chose two apps each for use in this study.

Choice of apps

We chose four apps to trial in this research. Judy selected two apps (Book Creator and Word Bingo) which she believed had potential for use in an English language learning context and reflected typical apps with either attention to form or creative expression, and Nicola chose two apps (Busuu French and Hiragana) she regarded as being relevant to foreign and modern language learning.

Judy's choice of Word Bingo and Book Creator exemplified two typical types of apps: attention to language as correct form and language as creative expression and communication of meaning.

Word Bingo includes four-word recognition and spelling game formats with multimodal features. All the games are timed, and players can choose from three speeds at which word prompts appear. Scoring allows users to compete with each other or rate themselves. The instructions state that it is based on Dolch List sight words, unrelated to any specific context, but identified as most common in children's literature. The first game, Word Bingo, is a traditional bingo game with spoken words to match by tapping the written word on a bingo screen. Spelling Practice involves dragging letters to spell the spoken word prompts. Word Fling is a timed game requiring players to match a spoken and written word. Correct responses show a "bingo bug" on the screen that the player then drags and pushes toward the edge of the screen to go into the "warp zone". Word It Up involves descending words that must be tapped as they are spoken to prevent them from filling the screen. Electronic music plays throughout the games, with sound effects and graphics to indicate correct and incorrect answers. The games can be played by up to four participants. Each player can select a cartoon character with various features and dress.

Book Creator, a creative app, presents a blank screen with icon options that allow users to select various tools to draw, paint, stamp, insert text or photos onto the screen, and

record sound. Users can create pages to compile as a book, play the book and publish it, then send it as a pdf or email. Instructions are available by tapping the “?” icon, but would be challenging for many EAL learners. Interactivity is possible as children compose and compare work. With this kind of app, students can participate creatively in school projects regardless of their level of English proficiency. The multimodality allows flexibility in modes of expression for all students.

Nicola chose Busuu French because French is the most commonly taught modern and foreign language in the New Zealand context (Education Counts, 2011), and because this app provided simple phrases for students to listen to and read (input), and there was an opportunity for output, addressing several aspects linked to effective instructed second language acquisition (Ellis, 2005). The choice of the Japanese Hiragana app was based on a desire to include an app featuring an Asian language and to have an app which focused on writing using a non-Latin script.

Busuu French (Busuu, 2013) is a part of a series of Busuu language apps covering many world languages. It opens with an index which allows the user to choose from several topics, to learn phrases with communicative potential (e.g., “nice to meet you”; “How are you?”, pets, size). For each topic there are four optional activities: 1) seeing (in English and French) and hearing (in French) phrases with accompanying still pictures; 2) hearing a dialogue which is written and spoken in French followed by a series of comprehension questions in French and English; 3) an online option not available in the free version of the app; and 4) an assessment multiple choice activity involving hearing or reading a French phrase and choosing the correct English translation from a set of four written options.

The Hiragana app (Hioki, 2013) opens with three activity windows to choose from. One provides an opportunity for students to trace the strokes needed to produce the hiragana symbols. Each hiragana symbol is accompanied by a picture of a vocabulary item starting with the symbol being learned. This vocabulary item is vocalised in a rhythmic chant. Another activity focuses on learning to put in order the hiragana to spell specific vocabulary items which are being chanted. A third activity presents a set of cards featuring pictures or hiragana of the different vocabulary items to choose from. The

learner must listen to the word/sound and touch the correct card. In all three activities, there is opportunity for both input (listening to the vocabulary being chanted, seeing the hiragana) and output (writing the symbol, choosing the correct picture or hiragana).

Trialling the apps

After ethical approval was obtained from our institution, students in WCLD were provided with a summary of the purpose of the research, the activities and time involved and the ways in which the data would be used. Volunteers were requested, and seven students attended one of the several 90-minute time slots made available. Most had seen iPads used in their practicum classes, where five or six iPads were shared among a few individuals or groups of students. At this session, participants were reminded of the details of the study and had an opportunity to ask questions before they signed a consent form.

A set of iPads, lent by our colleagues, were used for the trailing of the apps. These iPads were each set up with the four apps chosen and one was given to each of the participants. The trialling took place in a university tutorial room. The participants were asked to explore the apps either as a group or independently, and to answer the questions in a paper questionnaire (see appendix). No other guidelines were given as the purpose of our research was to see how the participants responded without direction from us. Two of the apps (Book Creator and Word Bingo) did, however, include some tutorial material which the participants made use of. The next section reports on their responses, using pseudonyms chosen by the participants.

Findings

Word Bingo

All the participants believed the app would be useful for identification of sight words and for spelling practice. They emphasised the value of high frequency sight words, and the development of automaticity. Michelle, Charlotte, Hendrix, Minni and Alex pointed out its usefulness for the formation of letters in the English alphabet. Michelle and Charlotte thought it would be helpful for learning the “sounds of words and letters”.

With the exception of Hendrix, Minni and Alex's group, they found it easy to use – they stated that it was appealing, nicely laid out, very clear, colourful, with different levels. Hendrix, Minni and Alex thought that the English instructions and menus could be hard for English language learners. Michelle and Charlotte responded that the tightly timed games could be a negative feature for some.

There was some inconsistency in responses to how well the app promoted interaction and participation and knowledge of language and skills. Regarding interaction and communication, most commented on the isolated single words, absence of communication, and lack of sentences or phrases as negative features. Michelle and Charlotte stated that it had an emphasis on sight words, not words that would be used everyday. Laura, however, commented that there was very good interaction in English. She may have been referring to the virtual interaction between the player and the game or possible competition among players. With reference to language forms and skills, again they commented on limitations due to the lack of sentence structure, phonics, and words in context. Grace commented favourably on the teaching of “spelling steps” and the modelling of “good pronunciation”. Hendrix, Minni and Alex noted its requirement for prior knowledge (presumably language knowledge), and called for improvements in the display of correct answers for greater prominence.

Book Creator

Generally the respondents found the tutorial (provided in the app) clear, especially with the range of modes, for example pictures. There was a comment on the difficulty of instructional language. It was also noted that personal content would need to be placed on the iPad, possibly implying the potential for loss of privacy. There were mixed responses to what participants thought users would learn from this app. No one noted language learning from the app; they did list the structure of a book, how to create images and text, typing, multimedia technology. Laura remarked that teachers could create resources from the app. They suggested it could be used in the classroom to create books and resources, as a tool for writing and presenting information like Prezzi and PowerPoint.

Referring to how well it facilitated interaction and participation, respondents' answers ranged from "nothing" to observations that learners could share "experiences of their own choice" and learn in groups or individually, and that it depended on how you used the app. One participant suggested, for example, that pages could be created based on common phrases. Hendrix, Minni and Alex noted that it required existing language knowledge. All agreed that the app didn't teach knowledge of language forms or skills, but at the same time, Michelle and Charlotte commented that there was "no pressure to do it right". Hendrix, Minni and Alex deemed it a "cool" programme, where children could create their own work, record ideas, include pictures and sound. They saw it as helpful to scaffold new English language learners, but seemed to consider it most useful for one's home language.

Busuu French

All of the seven participants acknowledged the potential value of the Busuu French app both for students in the classroom and the teacher. For students in a primary classroom, most participants noted that learners would have the opportunity to learn a range of greetings with conversational potential and other vocabulary including body parts. Grace also noted that the app provided an opportunity for French to be listened to, and that it provided both visual and aural cues. Laura noted the importance of the assessment aspect of the app to test what had been learnt. Many participants noted the importance of the app for providing examples of authentic pronunciation, and for providing a communicative context. They also noted the potential for the app to be used to reinforce and extend the existing French of students who already have some competency, and the opportunity for all learners to listen to French. Several participants noted that they felt this app would only be suitable for use in the classroom with some support or after some direct instruction.

All participants noted the usefulness of the app for the teacher to improve their own language competency by following the modules provided. Michelle and Charlotte commented on the importance of the app for supporting the pronunciation of the teacher.

Hiragana

For all of the participants, the fact that this app had no English interface presented challenges and frustrations. Hendrix, Minni and Alex noted that while the context of the app seemed “babyish” in many ways, at the same time the language seemed to be too complex for them as university students. They noted that they realised that while the app was puzzling to them as speakers of English, it may be marvellous for a Japanese child learning to write. Michelle, Charlotte and Laura noted their confusion as to whether the symbols being taught in the app were linked to a letter or a sound. Nonetheless they, along with Grace, acknowledged that the app could be used for learning to write Japanese symbols in a New Zealand primary classroom. Laura thought that the instructions on how to write the “letters” [sic] were clear, and that the various activities were visually fun and interactive. However, Michelle and Charlotte noted the complete lack of provision of language for interaction or participation in the target language community.

Researcher observations

While the participants were exploring the apps provided, we observed several things. The first was the frustration experienced by the participants when trialling the Hiragana app which did not use any English. While it was recorded that the participants found this very frustrating, they did come to the realisation (unrecorded) that this is what it must be like for EAL students when they first arrive in an English-medium classroom. Participants also commented on Hiragana’s responses to incorrect answers, which stuck them as culturally inappropriate for New Zealand. There were cartoon graphics of a child’s hands being smacked, smacking sound effects and a loud vocalisation in a disapproving tone.

Discussion and conclusion

Limitations

Our study was clearly limited by the small number of participants, implying a lack of generalisable conclusions. As well, although we knew that all the participants had used iPads and had observed limited iPad use in their practicum visits, we had no specific

data on their experience and expertise with MALL. Another limitation was that it seems most apps are designed to be able to be used in isolation. While it is possible for all of the apps we chose to be in a group (as some of our participants did), the fact that they could be used by a single person did mean that the concept of participation was perhaps not salient to the participants. Moreover, as the WCLD paper focused on linguistic diversity rather than language learning pedagogy (although this is covered briefly), the students in our course would have had a minimal understanding of language learning and teaching. Nonetheless, the study does shed some light on the kinds of basic needs pre-service teachers might have in order to fully make use of MALL in their classrooms, which is discussed below.

Summary of findings

Returning to our research question, our findings suggest that our pre-service teacher participants found the four apps presented to them useful in a range of ways for effective language learning. The Busuu French app (Busuu Limited, 2013) was seen as being useful in terms of providing examples of authentic pronunciation (both for teacher and student) and for providing phrases with communicative potential. While participants noted that Word Bingo (ABCya, 2012) and Hiragana (Hioki, 2013) were limited in providing language with communicative potential (i.e., single words were presented with no phrases), it was noted that there was potential for interaction in English in the playing of Word Bingo. Both Busuu French and Word Bingo were seen as having potential in providing authentic pronunciation models of French and English (albeit US pronunciation), respectively; however, this aspect of the Hiragana app for Japanese was not recognised. The perceived usefulness of the Hiragana app was limited by the lack of English used in the instructions for each of the games. The use of the target language throughout the app was not seen for its potential in providing authentic pronunciation, or input (Ellis, 2005). Nonetheless the clear diagrams and numbered strokes used to guide learners in producing the hiragana were acknowledged as providing clear instructions for learning how to produce hiragana (Ellis, 2005). Participants found the tutorial for Book Creator (Red Jumper, 2013) very clear, but despite seeing the potential for teachers to make resources for learners to share experiences and use their first language they did not see the potential for English

language learning from this app in terms of providing a creative output for EAL students in English medium classrooms.

Many of the responses from participants relating to how the MFL apps (Busuu French and Hiragana) could be incorporated into the classroom emphasised the need for pre-teaching and using the apps for practice and extension afterwards, rather than as a primary source of language input.

In sum, the participants found these apps useful and interesting, and easy to use to varying degrees. They were able to see a range of possibilities for language learning in primary classrooms, but they were not always aware of the full potential of some apps (particularly Book Creator and Hiragana).

Links to theory

The apps we surveyed and those we chose to trial focused heavily on language form, often in isolation. Interaction was achieved in competition and game formats. These features are likely to promote user engagement, but they may not involve a great deal of learning. (Word Bingo focused on speed and automaticity in the Dolch word list, a key element in traditional reading theory.) Moreover, Warschauer and Healey (1998), in a state-of-the-art article on CALL, reviewed extensive research that found “overall, software that requires a minimum of verbal interaction generates very little, while having students write a joint report or otherwise produce something collaboratively results in a substantial amount of interaction” (p. 62). In other words, the nature of the software (apps, in the current study), along with the tasks that teachers set, have an important bearing on peer interaction. So while many EAL and MFL apps may have a high first impression “wow factor”, they may not promote communicative language learning or extensive interactive language use (Murray & Barnes, 1998). They may, however, enable participation in competitive games.

Apps as pedagogical tools

The response of our participants indicated the potential usefulness of the four apps presented to them in various ways relating to language learning (e.g., spelling, writing, pronunciation, communication, and resource creation). Keeping in mind the very

minimal representativeness of the four apps chosen (however carefully chosen), it is clear that the participants can see a place for them in their future primary classrooms for language learning (both EAL and MFL). However, the responses to the apps also clearly indicated that the future teachers did not see these apps as an answer to meet all of the needs of the language learners in their classrooms, but rather as another possible pedagogical tool to be used in conjunction with other teaching methods.

The potential for Word Bingo and Busuu French to provide input (in terms of pronunciation) and to provide phrases with communicative potential (Busuu French) was recognised. However, the perceived limitations of apps which use the target language as the medium of instruction (e.g., Hiragana) or which provide open opportunities for creative output and participation (e.g., Book Creator) show the need for pre-service teachers to have the opportunity to experiment with and critically examine language learning apps in conjunction with language learning theory in order to become aware of their language learning potential. Without such opportunities there may be a danger of the apps leading the pedagogical practice, and leading it in less than ideal ways.

Integrating teacher knowledges: TPACK

Our theoretical discussion has followed from traditional CALL approaches underpinned by theories of language pedagogy. Our literature review has investigated recent MALL research has focused largely on teachers' and students' responses to mobile device learning experiences. We'd now like to return to the conceptual framework of TPACK (Mishra & Koehler, 2006). In the context of WCLD, technological knowledge would include, for example, understanding the apps' operation, availability, and device compatibility. Content knowledge would include, for instance, knowledge of language varieties and relationships between language and culture. The communicative language teaching approach illustrates pedagogical knowledge. Ideally all three need to come together in MALL and this is where TPACK comes in. Our findings highlight considerable variation and gaps in these pre-service teachers' knowledge about language itself (Japanese script as "letters"); pedagogical knowledge (dolch words as not for everyday use); and technological knowledge. Yet some were also insightful

about the affordances of creative apps, understanding the app, EAL learning needs, and language and multimodality. In other words, we see a need to foster pre-service teachers' partial, but developing, TPACK through a focus on the components and their dynamic integration. All this suggests a strong need for us as teacher educators to approach MALL from a more rigorous, knowledge-integrated, collaborative perspective, so that all our students work and learn with a sound conceptual framework. Without such integrated knowledge, MALL could easily continue the drill and gap-fill practices that concerned Warschauer and Healey in 1998.

Conclusions

What has this study taught us as teacher educators about promoting teachers' work with diversity in an increasingly technological environment? We believe our findings have several core implications. The kind of sessions we conducted for this research could be usefully incorporated into the set tutorial time for the WCLD paper (sufficient devices allowing). Our findings also suggest that pre-service teachers need time to think and experiment with apps (Wright, 2011). They need combined technological, pedagogical and content knowledge along with guidance to critically consider the value of apps and their affordances for creative output in target languages. Finally, they would benefit from time to explore how some language apps could help raise awareness of what it is like to be surrounded by an unfamiliar language. What is clear is that it is not the app itself, but the relevant knowledge and the way tasks are designed around an app that can lead to effective teacher education in relation to issues of cultural and linguistic diversity. Using apps in our teacher education to facilitate critical discussion of language and diversity-related issues may be a powerful approach, which allows pre-service teachers to integrate a range of knowledges through a technological medium.

Our findings also have implications for practising teachers and school leaders. Given their relative low cost (and sometimes no cost) it may be tempting to purchase language learning apps to service English language learners and Learning Languages programmes, but this small study indicates it is essential that professional development occurs concerning language pedagogical theory. For example a starting point could be the principles of effective instructed language acquisition (Ellis, 2005), and the

principles of intercultural language teaching (Newton et al., 2010), so that apps can be used to their greatest effect in the classroom, keeping in mind the importance of meaningful communication, participation, and intercultural awareness.

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Appendix

1. Your chosen pseudonyms
2. Name of app
3. How easy is it to use?
4. What do you think users will learn from this app? <ul style="list-style-type: none">○ Relating to language?○ Anything else?
5. In what ways could this app be used in a primary classroom?
6. In what ways do you think this app could be used by a teacher to improve their own language knowledge?

7. Briefly describe how well you think the app promotes:

- a) meaningful interaction in the target language
- b) meaningful participation in the language community

8. Briefly describe how well you think the app teaches knowledge of language forms and skills.



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