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HIGHER ORDER THINKING SKILLS AND LANGUAGE LEARNING: PRESENTING A MODEL FOR INCORPORATING CREATIVITY AND CRITICAL THINKING INTO CLASSROOM ACTIVITIES AND LANGUAGE TASKS

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Abstract

The education literature often extols the importance of skills that can be transferred to other fields of study or that can assist students for life-long learning and career development (Assiter, 1995; Fallows & Steven, 2013). Higher order thinking such as creativity and critical thinking are one particular area of these generic or transferrable skills. Especially in educational settings where language classes are positioned within general education or foundation studies, there could even be an institutional requirement that these skills be included within the curriculum. Because of this, teachers may wish to incorporate higher order thinking skills as a basis for language tasks; however, there seems to be little literature on exactly how teachers can achieve this. In this article, I will present a model for incorporating higher order thinking skills into language classrooms, provide some examples based on the first portion of the model, and exemplify how this model can be adapted to suit a task-based language teaching approach.

A taxonomy of higher order thinking objectives

Originally devised in 1956, Bloom's taxonomy of educational objectives has remained synonymous with higher order thinking in educational literature (Bloom, Englehart, Furst, Hill, & Krathwohl, 1956; Krathwohl, 2002). Cognitive skills within this taxonomy are structured based on their complexity and abstraction level, and this gives teachers a framework for developing a curriculum that progressively covers all levels. The taxonomy structure has remained remarkably stable over the half century since its inception. The highest levels of the taxonomy remain focused on developing creativity (*to create*) and critical thinking (*to evaluate*), and it is these two areas of higher order thinking on which I will focus in this article.

Definitions within the creativity literature are sometimes vague; however, the construct is mostly concerned with generating novel ideas (Runco, 2004a, 2004b) within commonly acceptable boundaries (Gardner & Wolf, 1994). Much of the previous literature on creativity has a decidedly mystical or intuitive basis for definition (Boden, 1994), resulting in a confusing array of perspectives and directions for the measurement and application of the construct (Plucker, Beghetto, & Dow, 2004). Despite this confusion, Runco (2004a) consolidates the research into the four areas of person, product, process and press (environment). Using this framework of the 4Ps, creativity can be defined

based on characteristics that make up a creative individual, define a creative object, define a creative process from a less creative one, or explain the elements within an environment that encourages rather than stifles creative endeavours. These four perspectives also provide a useful framework for incorporating creativity into the language classroom as will be explained further below.

Construct definitions within the critical thinking literature are much more consistent. Ennis (1987) defines critical thinking as "reasonable reflective thinking that is focused on deciding what to believe" (p.10), and Quellmalz (1987) summarizes the construct as focusing primarily on skills of analyzing, comparing, inferring, evaluating and judging. Based on this, critical thinking is focused on a process whereby a wide array of possibilities has some form of rational cognitive filter applied to reduce those options to a single acceptable outcome.

Taking a simple view of the definitions of creativity and critical thinking above may suggest the two concepts are diametrically opposed and should be treated in isolation from each other. However, this is an overly simplistic representation as the two often work in tandem. Isaksen, Dorval, and Treffinger (2011) outline the stages involved in the creative problem solving process. The initial stages of this process closely conform to the creative definitions presented above as novel ideas, possibilities and solutions to problems are generated. At some point, however, these ideas need to be pared back in order to reach an eventual creative product that conforms to the acceptable boundaries of the genre or artifact being produced. For example, no matter how creative a poem or painting is, it must still conform to what a poem or painting should generally constitute. Or alternatively, if students are expected to resolve a situation through creative ideas, those ideas must eventually conform to the realities of the situation. In sum, although much of the literature presents the concepts of creativity and critical thinking in isolation, there is much more crossover and cohesion between them than would initially appear. Thus, it makes sense that language teachers may choose to incorporate both these cognitive skills together as part of language focused activities within classrooms. In addition, higher order thinking can benefit language learning, as explained below.

Creativity and language learning
Some studies have shown a positive relationship between students' level of individual creativity and their language learning. Otto (1998) took a person-based measure of students' creativity and then compared this with their eventual grade in their English language class. The study shows significant correlations between the two variables. Albert and Kormos (2011) took a similar measure of creativity and gauged this with student performance on an oral narrative task. This study also showed creativity having a significant correlation with student performance in a language task, and similar results have been found in other spoken and written tasks (McDonough, Crawford, & Mackey, 2015; Pishghadam & Mehr, 2011). Findings from Albert (2011) also showed a positive

relationship between certain measures of creativity and language task performance with an increase in the creativity of a task leading to a corresponding increase in accuracy of language output. Although somewhat limited in providing a theoretical justification, the previously-mentioned studies indicate some empirical evidence for the inclusion or encouragement of creativity in the language classroom.

Critical thinking and language learning
Pally (1997) defines three different perspectives on how critical thinking has relevance to the language classroom. The first defines critical thinking in terms of written genres, the second as the psychological cognitive elements, and the third as a form of transformative pedagogy whereby students are empowered to challenge the status quo or power structures that have influence over their lives. The psychological cognitive perspective best aligns with Bloom's interpretation outlined above. Yang and Gamble (2013) utilized this perspective in developing a course incorporating peer critiques, analysis rubrics and debates to enhance students' critical thinking skills. Post-intervention scores showed significant improvements in both critical thinking skills and English proficiency. Similar results were identified by Fahim and Mirzaii (2014) who utilized dialogical critical thinking activities which resulted in significant improvements on argumentative written tasks compared to a control group.

Higher order thinking and motivation
Encouraging higher order thinking can be one way of encouraging student involvement in the language classroom. Dörnyei and Ushioda (2013) categorize self-determined forms of motivation as being either intrinsically or extrinsically sourced. Intrinsic motivation is sourced internally and is more effective in determining long term language learning achievement. This form of motivation is enhanced through activities that engage the learner through enjoyment, curiosity, satisfaction, exploration and creativity. Benson (2013) notes the importance student autonomy plays in encouraging intrinsic motivation. Some examples of practitioners using creativity and autonomy to enhance motivation, through creative project-based activities and negotiation, include Breen and Littlejohn (2000) and Ribe (2000).

Task-based language teaching
In this article, I differentiate between the concept of an activity and a task. This is primarily due to some overlap between the concepts, with the latter incorporating several additional features beneficial to language learning that the former may not. Some of these criteria include that a task should primarily focus on meaning, engage real-life cognitive processes, have a plan for completion, and have communicative outcomes (Ellis, 2003; Nunan, 2004; Van den Branden, 2006). Language task learning derives from the interaction, negotiation, noticing and scaffolding that students experience (Ellis, 2003, 2008; Samuda & Bygate, 2008). That is, meaningful interaction encourages students to stretch their language through trialing new or recycled language features to communicate

their intended message. Positive or negative feedback from their interlocutor then allows the student to notice whether or not the message has been communicated successfully, and adjust and retrial if it has not. Being completed in a group also allows new or correct language forms to be acquired through social scaffolding. In addition, Nunan (2004) notes how procedural language utilized outside the task itself can be beneficial to learners. This type of procedural language can result in positive learning opportunities just as much as the targeted language within the task itself.

The focus on meaning within tasks does not infer a complete lack of focus on form, as the two can often be addressed concurrently within a successful task. This difference in type of form-focus derives from whether the task target language features are focused or unfocused (Ellis, Basturkmen, & Loewen, 2002; Nunan, 2004). Focused tasks require targeted language features which the task is intended to elicit whereas unfocused tasks do not. The language features and learning derived from unfocused tasks therefore arise incidentally and are unpredictable. For both focused and unfocused tasks the noticing of language forms can be addressed through consciousness raising activities pre- or post-task completion (Fotos, 1994; Nunan, 2004). In the case of focused tasks, this can be carried out pre-task, whereas this will usually occur post-task for unfocused tasks. Another consideration is the amount of task planning time that students will have available. Task planning can either be pre-task or online (while the task is underway) (Ellis, 2005). Pre-task planning can free up online attentional resources and aid in language performance (Foster & Skehan, 1996). Finally, language performance also benefits from task repetition (Bygate, 1996; Lynch & Maclean, 2000).

In sum, the literature provides some evidence for a direct beneficial relationship between either creativity or critical thinking and language learning. In addition, there appears to be some theoretical foundation for an indirect beneficial effect through encouraging self-determined forms of intrinsic motivation through engaging activities utilizing creativity and critical thinking, and a task-based framework can encourage acquisition of the language elicited. Below, I will present a possible model to guide teachers if they want to incorporate these higher order thinking skills within their language classrooms, and explore some suggested activities based mainly on the first half of this model. In addition, I will provide a modified task-based procedure to one of the activities to ensure task-based language learning benefits are engaged.

A model for incorporating higher order thinking into language activities
In Figure 1, I suggest a model that can guide teachers who wish to encourage higher-level thinking while still encouraging communicative language within their classroom. The model is an adaptation of a creative problem solving approach from Isaksen et al. (2011) with adjustments made for a second language classroom context, and is broken down into two main phases. The first phase focuses on generating creative ideas, while the second focuses on reducing a multitude of ideas to one final answer through critical thinking.

At the beginning of phase 1, the teacher can present or prepare a scenario that students need to resolve with the ideas they generate. This scenario could be a realistic problem that needs fixing or alternatively an imaginative, interesting or fun basis to give students some context for developing ideas. The bullet point boxes within either side of the model present the types of thinking skills which should be encouraged in each phase. For the creativity phase, these skills are concerned with the expansion of ideas, whereas the critical thinking skills are focused on reduction. Phase 1 or phase 2 can be completed individually by students, or alternatively as pair or group discussion activities if the teacher wishes to make these more communicative. Likewise, communicative language can also be incorporated into the model between phase 1 and phase 2 when students can descriptively or informatively communicate ideas they have generated, and then again after phase 2 when they can again express the resolution, as well as the reasoning and justification for that decision to their pair, group or overall class. This language output could be in either oral or written form.
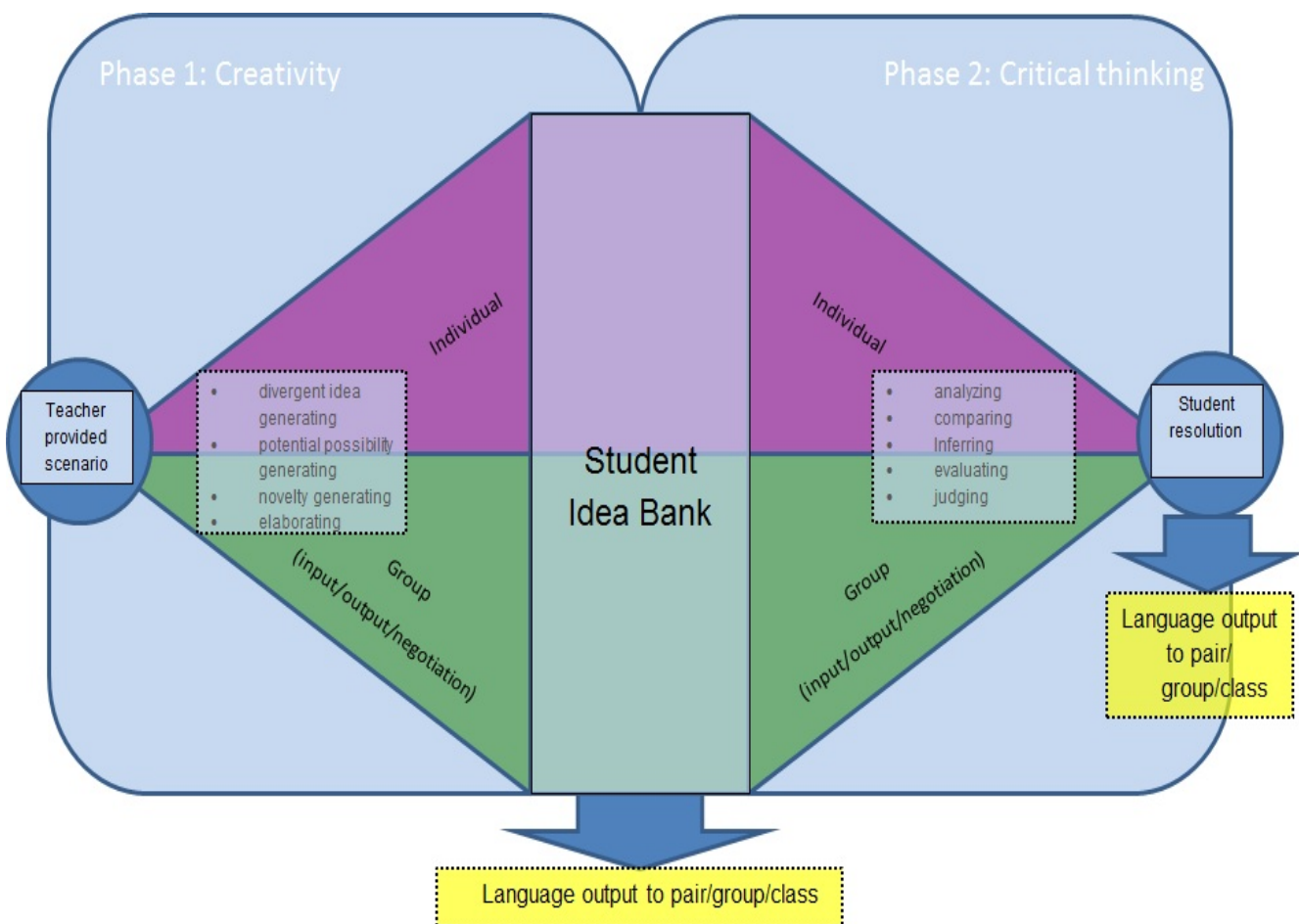

Figure 1:
A model for incorporating higher order thinking into language activities

Phase 1: Creativity
Based on this model, activities for students can initially focus on the generation without judgment of novel and unpredictable ideas. In this way, students can defer judgment to the follow-up stages utilizing more critically directed thinking (Baer & Kaufman, 2012; Isaksen et al., 2011). Students should not be provided with too much overt modelling within phase 1, although avoiding this can sometimes be a challenge. As teachers, a key part of our classroom role is the modelling of activities and targeted language for students. The more a creative activity is modeled, however, the more the limitations of that model are impressed on a student's mind, making it less likely they will stray outside those limitations (Torrance, 1977). This is always a balance as the ideal situation would be to both promote creativity in class while also limiting the likelihood of students generating completely bizarre contributions, ideas that are unrelated to the scenario at hand, or language forms and texts which stray outside the boundaries of an accepted genre. In short, creativity is always a balance between encouraging novelty and originality within a genre, while still conforming to the inherent limitations of that genre.

Phase 2: Critical thinking
Once students have arrived at the midpoint of the model, they should have a bank of ideas to work from. They may have arrived at this bank individually, through their group, or as a whole class as a result of classroom sharing or feedback of ideas. Alternatively, teachers may wish to simply ignore phase 1, and instead bring a pre-prepared bank of ideas to start directly at phase 2. In this second phase, students must pare back the total bank of possible ideas to a reduced number that they feel is most suitable through the application of analyzing, comparing and other critical thinking methods noted in the bulleted box. Again, this can be done individually or more communicatively through group or pair discussion.

Below are some suggested activities mostly incorporating student creativity based on phase 1 of the model. For clarity, they are categorized into small-scale and large-scale activities. The small-scale activities can be done as part of a single class period or less, whereas the large-scale activities will likely extend beyond a single class period and are therefore suitable for incorporation into larger student projects or assignments. For some other interesting activities suited to phase 2, teachers may wish to refer to Ur (1981).

Small-scale creativity activities for the language classroom
Mental imaging
Finke and Slayton (1988) outline an interesting idea for gauging an individual's ability to manipulate and recombine simple geometric shapes into some kind of newly created image.
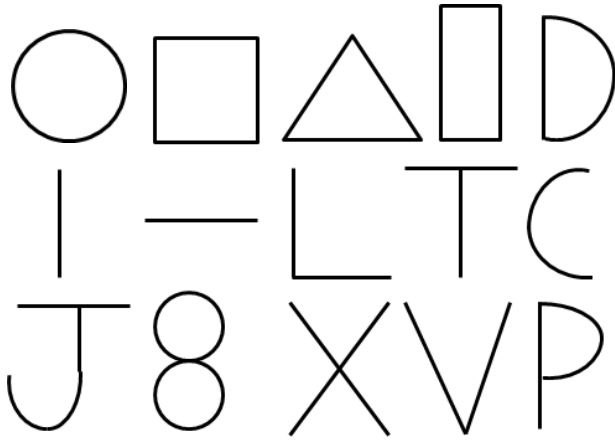
Figure 2:
Finke and Slayton's (1988) basic geometric shapes

Teachers can randomly choose three of the initial basic shapes from Figure 2 and show these to students. Students need to resize, rotate and recombine each of the three shapes into some kind of recognizable new image. The teacher can also introduce a time limit during which students should continue to produce as many novel images as possible. This activity works well when initially done individually, followed by students sharing their creations with other students or the class. Once a bank of ideas has been generated, students can work in groups to guess what the new images are supposed to resemble, or the shapes can be used as a basis for a more communicative follow-up activity as explained below.

New road signs
Another activity involves assigning a fixed number of Finke and Slayton's basic geometric shapes to students which they recombine to create something functional. An example activity could start with students brainstorming dangerous situations around their city roads. Following this, using the assigned basic geometric shapes, students would need to design some kind of road sign that warns about this danger.

The unfortunately fortunate writing activity
Similar to other story chains, the unfortunately fortunate activity (Bowkett, 2007) builds a story within a group by students writing a sentence, passing the paper, reading what the previous student has written, and then developing the story further. The difference in the unfortunately fortunate writing activity, however, is teachers can actively encourage creative and unexpected turns in the story by forcing students to think in unexpected ways. Teachers can do this by beginning the paragraph with a sentence such as the following:

> *Yesterday was the most unexpected day of my life. It started when…*

Having completed the sentence and passed their paper to the next person, students can then continue with the story; however, the teacher should lead the story by assigning words or phrases to begin each sentence such as the following:

> *Fortunately,….*
> *Unfortunately,…*
> *Fortunately,…*
> *Because of this,…*
> *In spite of this,…*
> *In the end,…*

Using words such as these forces students to have to backtrack, improvise and progress the story in a non-linear fashion. After completing the story, the group can choose the best or most creative story from their group to share with the class.

What if?
Also suggested by Bowkett (2007), the 'what if?' activity encourages students to reassess the assumptions they hold about the way the world is and to speculate on how completely different things would be if these assumptions were false. The teacher can pose some questions to students such as the following:

> *How would our lives be different if the world were flat?*
> *How would our lives be different if humans were nocturnal?*
> *How would things be different if we were born old and grew younger?*

The above scenarios are fairly benign; however, these can be taken in more sophisticated directions by adding complexity to the themes or topics being covered.

Large-scale creativity activities for the language classroom
Projects which extend over more than one class period can also provide an ideal basis for encouraging students' creative input and ideas. Motivation for these types of projects can be enhanced through ensuring the scenarios and topics are realistic and relevant to the students' lives and by having an authentic audience for the output or resolution to the scenario (Renzulli & Reis, 2008).

Attribute listing and reformulating
After being presented with a large scale scenario, idea or problem, students can utilize a technique from Isaksen et al. (2011) by breaking the scenario down into its most basic elements. After this, students can generate creative ideas for modifying these elements and then rebuild the modified elements back into the original scenario, idea or problem. In phase 2 of the model, students would critically analyze how the original scenarios would be enhanced, modified or improved based on the creative ideas.

Use of analogies
The activity above can be further enhanced with the use of an analogy generating activity from VanGundy (2005). In this activity, after breaking the whole scenario into its separate attributes, creative modifications to the attributes can be explored by analogizing each element or by using the overall scenario.

S.C.A.M.P.E.R.
Also from Isaksen et al. (2011), this acronym stands for Substitute, Combine, Adapt, Modify, Put to other uses, Eliminate, Rearrange/Reverse. This activity also works well when combined with the attribute listing activity above by forcing students to reassess how they view the original scenario. Once students have broken down the original scenario into its most basic elements, they can imagine, revise and update those elements via the S.C.A.M.P.E.R. framework.

Adapting higher order thinking activities to prepare language tasks
The overarching theme of this article so far is that conceptualization of higher order ideas and thinking skills are important to students within second language classrooms. This does not, however, override the importance of developing the language itself and providing communicative opportunities to make use of this language. In their current form, the previous suggestions can be considered more as conceptualization activities rather than language tasks according to the task criteria introduced earlier. Modifications however in format and procedure for these suggestions can develop them from being purely conceptual to fulfilling a more communicative and interactional language function, and assisting students' language acquisition. Below, I will develop the unfortunately fortunate activity from the phase 1 creativity side of the model presented above into an unfocused language task with post-task form-focused consciousness raising carried out on the language elicited from students during the task, and task repetition and extension to recycle and build upon these elicited language forms. Through these task modifications, this phase 1 activity can better target language development. A primarily unfocused task format was chosen as creativity is related to novel and unpredictable ideas, with the language used to convey these ideas likely being equally unpredictable. This gives the opportunity for students to (a) primarily focus on meaning, (b) focus on form after a good amount of ideas and language have been elicited through carrying out the task, and (c) use the ideas generated for a phase 2 critical thinking directed follow-up task to incorporate more focused language.

Step 1: Task preparation
Preparing students' schematic expectations is important for effective writing (Gordon & Braun, 1983; Hennings, 1982). Also as noted above, pre-task planning can free up attentional resources to improve task performance. Because of this, teachers may like to prepare an example story similar to the unfortunately fortunate structure that they can either read to students or have students read themselves. In addition while reading this

text, students can complete some kind of basic comprehension activity such as putting cut-up pictures in the correct order as they occur in the story. Providing too strict a textual model may limit students' ability to think creatively when it comes to drafting their own stories afterwards, and much of the enjoyment of drafting their stories derives from the unexpected turns within the story. For this reason, care should be taken that the story provided does not conceptually limit the writing the students will create themselves. One option to overcome this is to provide an example that is conceptually plain, in the sense that the ideas and content are predictable and mundane, but holds the same textual schematic qualities as are being targeted by the task. For example, a suitable text for the unfortunately fortunate activity could be a written story detailing the order of a person's non-eventful daily routine which occurred in the recent past.

Step 2: Writing
Place at least three students together in a group and give directions that they are going to draft a story similar to the one they have just read, and the teacher is going to help them by giving the first word of each sentence. At this point, an additional point of novelty, a key determinant of creativity, can be added by not informing students that they will be building the story together with their groupmates. After they have drafted the first sentence, however, ask students to pass their paper to the person next to them, and continue as per outlined previously. The writing should be timed so students have adequate time to generate and formulate ideas without too much judgment or evaluation of those ideas. This judgement free conceptualization is important for creative idea generation (Isaksen et al., 2011).

Step 3: Interaction, negotiation and scaffolding
As the students pass their paper to their groupmates, several opportunities arise for interaction, negotiation and scaffolding from both within and outside the text itself. Inside the text, students will need to read what the prior student has written and build upon it. This necessitates them reading and comprehending the message as well as mapping form to meaning through their language as they add to the story with their own ideas. They will also be writing with the expectation that their story will be passed to and read by the next groupmate, and will therefore attempt to clearly communicate these ideas through their language. As the stories often develop into humorous, unrealistic and imaginary scenarios, the language needed to convey these ideas may also be unlike what students are usually exposed to in the language classroom (Kim & Elder, 2005; Walsh, 2002). As noted above, it is this type of stretching of language output that can assist with language development, and also where creative ideas may be particularly beneficial for language learning. For example, common classroom dialogue can often take a teacher initiation – student response – teacher feedback (IRF) structure, and Waring (2009) notes how increasing learner agency in the task process can lead to more complex language production.

Also outside the texts, procedural language use provides opportunity for interaction, negotiation and scaffolding. Nunan (2004) describes procedural language as the beneficial 'byproduct' outside the targeted task language itself. If a student receives a story and the meaning within the story is unclear, s/he will be forced to seek clarification from the previous groupmate. This clarification will form the basis for the interaction, negotiation and modification of the language so that the meaning is clear. The teacher may enforce a return rule where, if the idea within a sentence is incomprehensible, the paper needs to be returned to the previous groupmate and language within the sentence revised before the story can proceed. Alternatively, the negotiation of meaning and correction can occur verbally, and the current groupmate can make the adjustments to the previous sentence themselves. If the class contains a number of students from the same L1, the teacher will also need to decide to what extent using the L1 during this negotiation is acceptable. In certain circumstances, the use of L1 for procedural language can be beneficial through freeing up cognitive resources to attend to the language task at hand (Scott & Fuente, 2008). If the negotiation is to occur in the L2, the teacher should circulate and monitor the interactions, and make note of any problematic language. For example, procedural language seeking clarification on the details of the previous writer will likely require *yes/no* and *wh-interrogative* sentences pertaining to time, order and detail. Language structures such as these can form the basis for part of the consciousness raising activities in step 4.

Step 4: Incidental focus on form through consciousness raising
After the writing has been completed, both the written and procedural language generated can be used as a basis for form-focused consciousness raising tasks. Firstly from the monitoring, the teacher may list on the whiteboard some of the sentences containing common form-focused problems that occurred in the procedural language. Students can then work with their group or individually to determine what exactly the form-focused problems in each sentence are, and how they should be corrected. Teacher-led scaffolding can be carried out at this point by initially giving no indication of where exactly in the sentence the error is, followed by focusing on the error through either underlining the part of the sentence specifically where the error resides, or posing guiding questions to students to assist them to successfully identify and self-correct the errors. The written texts also make an excellent basis to work on form-focused language problems. Through monitoring while students were completing the task, or by reviewing the texts afterwards, the teacher can do some analysis of common language problems evident within the texts. A follow-up conscious-raising task can then be carried out on a selection of texts from the class which do and do not exhibit these errors. For example, as students' unfortunately fortunate stories were a fictitious retelling of what occurred yesterday, texts should have widespread use of the past verb tense. One student text which correctly utilized past verb tenses and another which did not can be given to each student. Students can then be instructed to (a) analyze and underline all verbs within both texts, (b) identify underneath

whether the verb tense is past, present, or future tense, and (c) decide whether the verb tense serves the correct purpose within the sentence. Following this, the teacher can confirm the answers for both texts, and students can return to their own groups' stories, and repeat the process. An alternative focus for nouns could be to (a) underline all the nouns within each texts, (b) circle the article, quantifier or determiner associated with each noun, and (c) decide whether each of these is correct. Using a table format which students need to copy the details in to can also assist with isolating the language for clarifying the rules.

The focus on form suggested above for the unfortunately fortunate activity exemplifies the type of language that could be addressed within the context of a lower language level creative narrative task, which falls within phase 1 of the model presented in figure 1. For higher level students and for tasks which incorporate both phase 1 and phase 2 of the model through both creative and critical thinking, the consciousness raising can address a much wider range of more focused structures. For example, McEnery and Kifle (2002) note the importance of modal verb usage in effective critical writing, and both creative and critical tasks require extensive use of sentence subordination and coordination for reasoning through conjunctions such as *so*, *because*, or *and* (McDonough et al., 2015; Stapleton, 2002). In addition, with EAP classes, the consciousness raising could extend outside the language itself to address elements such as purpose, audience and context.

Step 5: Task repetition and extension
As noted earlier, repeating a task more than once can aid in performance as well as help recycle any form-focused language raised through step 4. There are many ways that this could be done for the unfortunately fortunate activity with differing levels of creativity depending on whether the teacher wishes to recycle or adjust either the language requirements within the task itself or procedural language around the task. The least novel option would be for students to simply re-draft their original stories with the original errors corrected. Alternatively, they could be assigned to new groups and the task carried out from start to finish again in the same manner. This would allow them to both repeat the task and procedural language, which by this stage has both had some form-focused attention through step 4, and also have the creative opportunities through working with new groupmates.

In addition, the texts generated through the unfortunately fortunate activity (a phase 1: creativity activity) could provide a student idea bank to be used as a basis for a phase 2 critical thinking activity, as suggested by the model above. For example, a selection of student texts could be chosen, and all students required to individually read each and evaluate with justifications the one best story to adapt to a screenplay for a blockbuster movie. This evaluation could be in either a spoken or written form and would likely incorporate the types of modal verbs, sentence subordination and sentence coordination noted above. Also as above, once this critical thinking activity has been completed, the

student generated language in the evaluations could again be used as a basis for consciousness raising and focus on form, and in turn provide a student idea bank to be used as a basis for further task repetition or extension activities. In this way, motivation can be encouraged by continuing student involvement, conceptual cohesion can be maintained across different tasks, higher order thinking can be encouraged, and the tasks remain meaningful to students with form-focused language being addressed incidentally.

Finally, the example task procedure outlined above addresses the focus on form and consciousness raising post-task; however, this could alternatively be addressed at step 1. Whereas in step 1 above, only the schematic qualities of an example text are addressed, this could be extended to include the consciousness raising of language elements noted in step 4, followed by a basic concept checking activity on these elements, before getting the actual task underway. Regardless of the task procedure order, the focus should remain on keeping the language use meaningful and, for phase 1 creativity tasks, providing examples that are conceptually plain enough for students to feel able to fill their output with novel and unpredictable ideas when they undertake the tasks for themselves. Furthermore, the unfortunately fortunate example above uses an activity suited to low level language learners. The task procedure would be just as relevant however for higher level students who are able to conceptually and linguistically deal with more complexity within phase 1 and phase 2 of the higher order thinking in the language learning activities model.

Conclusion

The model I present above gives a framework for student motivation and higher order thinking development. While higher order thinking skills have been shown to be beneficial to language learning, purely conceptualization activities provide inadequate opportunities for language interaction, negotiation and scaffolding. These are fundamental elements that encourage language learning within a task-based framework. Using the model as a basis for conceptualization, however, while utilizing a task-based framework for the language output provides an approach that can target the learning benefits from both higher order thinking development and task-based language learning.

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THE VALUE OF READER-ENGAGEMENT FEATURES IN SELF-IMPROVEMENT BOOKS FOR LIMITED ENGLISH PROFICIENCY READERS

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Abstract

Promoting interest for reading among adolescent learners with limited English proficiency and selecting appropriate materials for the learners are challenging tasks for teachers. While ESL teachers are aware of the importance of selecting reading materials that are engaging, identifying such materials is often not a straightforward process. The main purpose of this article is to discuss the value of reader-engagement features in selecting appropriate materials. Focusing on texts from self-improvement books as an exemplar of an 'authentic' popular genre, a study of these books, using a discourse analytic methodology, shows that they are rich in engagement elements (e.g., reader pronouns, directives). Other engagement features that I have identified are stories and aphorisms. This article concludes that texts that are rich in reader-engagement features are a resource for promoting interest for reading particularly among learners with limited proficiency.

Introduction

The main purpose of this article is to discuss the value of reader-engagement features in selecting appropriate materials to promote interest for reading among adolescent learners with limited English proficiency. Drawing on Hyland's (2005, p. 176) definition of engagement, this paper defines reader-engagement features as linguistic resources that writers use to connect with readers, acknowledge readers' presence and focus their attention. Although research (e.g., McGrath, 2002; Rubdy, 2003) maintains the importance of engagement as a criterion for selecting materials and indicates that teachers are generally aware of the importance of selecting materials that are engaging, the selection process is often based primarily on teachers' or learners' perception. To assist this process, I demonstrate how discourse analytic methodology (e.g., analysing how grammatical structure makes meaning) can better inform teachers and help them select materials more effectively. In discussing reader-engagement features, this article focuses on texts from self-improvement books. Koay (2015) shows that this genre is rich in these features compared to other non-fiction texts. Beginning with a brief introduction to self-improvement books, this article provides a brief anecdotal account of how these texts are used in an ESL classroom. I will then discuss the reader-engagement features and their implication for materials selection and future research possibilities.

What are self-improvement books?

Self-improvement books, more commonly known as self-help books, are books that attempt to help and inspire their readership to improve their lives (Koay, 2015). More specifically, Dolby (2005, viii) observes that these books are often read as a source for growing wisdom and leading a satisfying life. The common themes in these books include self-discovery, finding inner strength and overcoming adversity (McKay & Bonner, 2002; Woodstock, 2005). As the label suggests, individuals, these books say, are primarily responsible for improving their lives. In terms of language, Koay (2015) shows that authors of self-improvement books claim to write in an accessible and/or conversational style with the intention to reach the widest readership possible. This claim, however, needs further investigation because no author, to my knowledge, has examined the reading level at which this genre is written (e.g., vocabulary size needed to read self-improvement books). Because the primary goal of these books is to persuade readers and possibly sceptics to 'buy' their advice, the language that authors use is personal and rich in reader-engagement features.

Self-improvement books in an ESL classroom

While teaching learners with limited proficiency aged between 15 and 18 in public secondary schools in Malaysia and discussing factual topics such as drug abuse, health, and pollution from the textbooks, I have observed that using these materials often results in reluctant participation among these learners. Similar issues with learner reluctance and limited proficiency have been identified by other researchers in Malaysia (Mohd Asraf & Ahmad, 2003; Samuel & Sithamparam, 2011), which suggests this is not a unique issue. Interaction with learners suggests that they found these topics difficult to relate to mainly because the topics are typically not presented as having immediate relevance to them. For example, pollution is presented as a topic without discussing the immediate consequences it has on readers. In other words, these topics are presented in a less personal way compared to those in self-improvement books.

In a search for materials which have an appropriate level of language that learners are comfortable with, I decided to use materials that were designed for younger learners and were available in the school where I taught. However, the learners often found that the layout and topics included in these materials were not very interesting because of the fact they were aimed at younger learners.

As an alternative to the topics and materials mentioned above, in my classroom I introduced texts and quotes from self-improvement books as 'authentic' materials that are written for adults yet more accessible in terms of language. Because this genre is written in a very accessible style, the reading burden is reduced and this results in making reading more manageable and achievable. In terms of topic, classroom observation shows that the learners were able to relate to them because they are written for a wide audience.

How to use texts from self-improvement books for teaching
The following is a brief description of how the texts were used in my classroom. The class started by discussing a list of questions related to achieving personal goals in small groups. This pre-reading activity had the purpose of activating learners' schema knowledge. Carrell and Eisterhold (1983, p. 556) define schema knowledge as readers' previously acquired knowledge. They explain that preparing learners topically for reading comprehension activities is important because the ability to relate a text to readers' background knowledge often determines the success of comprehension. The following are examples of instructions and questions used:

1. What are some of the things you would like to achieve?
2. What does being successful mean to you?
3. Describe a person whom you consider to be successful.
4. In your opinion, what are some of the ingredients for success? Provide examples from your experience/observation.

After the pre-reading activity, learners were given a text (see example from Maxwell, 2007) selected from a self-improvement book to read individually. The tasks required learners to identify and explain ideas from the text that they agree or disagree with. Because my purpose for using texts from self-improvement books was to promote interest for reading rather than teaching/practising reading comprehension, the task was not designed to ask learners to identify main ideas from the texts. Also, giving learners the opportunity to decide what they agree or disagree with in the text not only promotes learner autonomy, but also encourages critical thinking. This is because the decision-making process and explaining why they agree/disagree with a particular idea involves reasoning skills. These processes allow learners to bring their knowledge from outside the classroom into the classroom. Because the topics in self-improvement books are primarily about happiness, relationships, and careers, the learners usually have sufficient knowledge to make sense of the texts and participate in the task.

This paper aims to understand why learners participated more actively when texts from self-improvement books were used as materials in the classroom. Specifically, this paper seeks to address the following question:

How do texts from self-improvement books contribute to active learner-participation in a language classroom?

Reader-engagement features in self-improvement books
Hyland (2005) provides a comprehensive explanation of engagement and my study draws on his explanation. He defines it as a "dimension where writers acknowledge and connect to others, recognising the presence of their readers, pulling them along with their argument, focusing their attention, acknowledging their uncertainties, including them as discourse participants, and guiding them to interpretations" (p. 176). Hyland's definition

of engagement focuses on what writers 'do' in the attempt to engage their readers. To analyse the resources that self-improvement authors use, I modified and extended Hyland's (2005) system of engagement, as demonstrated in Figure 1. The improvised system consists of five engagement elements: reader pronouns, directives, questions, stories, and aphorisms.
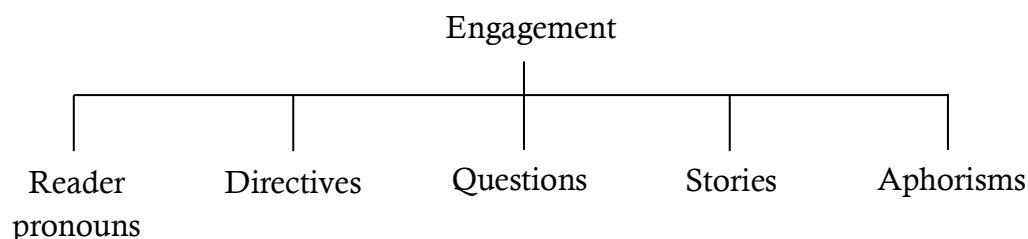
Figure 1:
Engagement elements in self-improvement books

The first three elements (i.e., reader pronouns, directives and questions) can be categorised as grammatical realisations of engagement, and stories and aphorisms are not identified by grammatical units (e.g., noun, phrase, clause) in a traditional sense. To illustrate the three grammatical realisations of engagement in self-improvement books, consider the excerpt below:

> How would you rate yourself on a scale of 1 to 10 when it comes to self-discipline (with 10 being perfect)? Is yours what you would consider to be an acceptable score? How can you improve in this area? Identify specific goals that will help you. Remember that self-discipline is a lifestyle to be achieved. The more disciplined you are in one area, the more it helps you become disciplined in others. Each victory makes you stronger.[1]

Reader pronouns
Hyland (2005) explains that *reader pronouns* (e.g., *you*, *your*, inclusive-*we*) are the most explicit way to address readers. As can be seen in the excerpt above, the text frequently addresses the readers using *you*, *your*, *yours*, and *yourself*. Consider this example from the excerpt:

> Each victory makes *you* stronger.

Addressing the readers as *you* in the above example, as Hyland (2005) explains, is a tool that authors use to construct closeness with readers and acknowledge their presence in the text. Fu (2012, p. 409) analysed job postings and he proposed that the abundance of *you* in the genre he studied indicates that it has an "addressee-oriented character". Fu's idea suggests that the abundance of reader pronouns in self-improvement books shows that

these books have a strong reader orientation. In other words, this feature suggests that readers are the focus of the topics discussed in this genre.

Directives
Directives are used to instruct readers to perform a particular action (Hyland, 2005, p. 184). In the excerpt, the actions that readers are directed to perform are to identify goals that will help them improve their self-discipline, and to remember that it is a lifestyle that readers should aim for. Consider this example:

> Remember that self-discipline is a lifestyle to be achieved.

This example shows that the author uses an imperative clause to remind the readers of a particular point. This point is probably mentioned earlier in the text or is an assumed knowledge that readers would have prior to reading this statement in an explicit manner. In terms of engagement, a directive implies an audience of an immediate addressee. Similar to reader pronouns, using directives acknowledges readers' presence and makes the readers visible in the text.

Questions
Hyland (2005) explains that *questions* are used to arouse interest and encourage readers to explore a particular topic, constructing them as conversational partners. Similar to *reader pronouns* and *directives*, *questions* anticipate an audience and hence are a resource for acknowledging readers' presence. In self-improvement books, questions are sometimes used as a resource to invite readers to reflect on a particular topic. For example:

> How can *you* improve in this area?

The above example shows that questions can be a resource for prompting readers to think about their lives. It is not an information seeking question because the author is unlikely to anticipate an answer from the readers. Also, the question above has the pronoun *you*, and this element contributes to a strong reader orientation compared to questions without reader pronouns.

Stories
Besides the grammatical features mentioned above, Koay's (2015) analysis shows that stories are a feature of self-improvement books and authors use them as a strategy to help readers remember their message. Drawing on Bamberg and Georgakopoulou (2008), this paper uses the term *stories* to refer to accounts of sequences of events. Although *narrative* is a term commonly used in the literature, this term is not employed in this paper because it is traditionally used to refer to stories that have a complication-resolution structure (e.g., Labov & Waletzky, 1967; Martin & Rose, 2008, Thornbury & Slade, 2006). Here, stories do not necessarily have this structure.

Stories are a genre that learners are familiar with because it is usually introduced at an early stage of literacy learning. This familiarity reduces the reading burden on learners resulting in a more manageable reading experience. Also, as these stories are embedded within the main text in self-improvement books, they are typically not very long. Constrained by the lengths of the stories, their plots are usually simple. The length of the stories and the character of the plots make this feature particularly useful in terms of sustaining readers' attention.

The stories in self-improvement books typically have 'take-home' messages that usually function as advice. In some ways, the advice has a similar function as a directive because it instructs readers to perform a particular action or think in a particular way. These messages are typically found at the end of the stories or the *coda*, and they are rich in the grammatical realisations of engagement (i.e., reader pronouns, directives and questions). The following is an example of a story that ends with a *coda*:

> The biggest influence on the way we think is the people we are around. We all know what a big effect peer pressure can have on children and teenagers. Say a teenager has been a great student, never getting in trouble, making good grades, showing respect for adults, and the like.
> Then he suddenly changes. He starts smoking and drinking. His grades drop. He starts using bad language and talking back to his parents and teachers. If you were to ask his parents what happened, most of the time they would say that the young man "fell into a bad crowd". We all know that teens are incredibly susceptible to taking on the attitudes, beliefs, and behaviors of those around them.
> When does that change? When do we stop being strongly influenced by those around us? At twenty, thirty, or forty? Not at all. We stop being influenced by those around us when we die. Until then, we will be like the people we surround ourselves with.
> For that reason, we must look very closely at the people we choose to be around. Are they the type of people we want to become? If not, then we must find a way to get around the people who are. As corny as it sounds, you really can't soar with the eagles when you are surrounded by turkeys.[2]

The abundance of personal pronouns in the coda suggests that engaging the readers at this section of a story is crucial because it is where the purpose of telling the story or the 'take home' message is expressed. Another feature that is typical of the coda is questions. In the above example, the question is in yes/no form and it serves as a resource to solicit agreement and to promote reflection. In terms of reader-engagement, such questions invite readers to relate the message to their personal experience. Such attempts suggest that stories in self-improvement books are reader-oriented.

Aphorisms

Another engagement feature of self-improvement books are aphorisms. In this paper, aphorisms refer to popular sayings, proverbs and quotes. They are usually short statements that are written in a catchy style to attract readers' attention. In other words, their main functions are to help readers remember a particular point or to summarise an author's message. Koay (2015) found that readers of self-improvement books claimed that they sometimes select, from these books, aphorisms that they find meaningful and relevant to their present situations or, more generally, their lives. Some copy these statements to their diaries or post them on their refrigerators. The following is an example of an aphorism:

> Nelson Mandela said, "Courage isn't the absence of fear but the conquering of fear." (Muncy, 2002, p. 84)

The aphorism in this example shows that it is used to concisely introduce a concept or define the word *courage*. Based on my experience of using texts from self-improvement books in an ESL classroom, some learners copied aphorisms that they found meaningful in their notebooks, although this activity was not part of the task I assigned. This suggests that the learners were actively engaged with the aphorisms they read and implies that this feature has the potential to promote interest in reading. Also, as aphorisms are typically short statements, they can help to focus learners' attention, particularly learners with limited proficiency. This feature is commonly found in the introduction and body chapters of self-improvement books.

Discussion

Using materials that are engaging in an ESL classroom is important because it takes into consideration the affective aspect of language learning. While ESL teachers are aware of the importance of selecting texts that are engaging, existing methodologies for evaluating the engagement aspect of materials are mainly based on learners' and teachers' perceptions, and the process of selecting engaging materials is often arbitrary. The engagement system (see Figure 1) allows teachers to evaluate the engagement aspect of teaching materials using a more objective methodology (e.g., analysing the frequency of reader pronouns) rather than perception-based methodologies (e.g., interview, questionnaire). Also, this system serves as a practical tool that teachers can use for evaluating materials. Another benefit of this methodology is that it allows teachers to predictively evaluate materials before they are introduced in the classroom.

As an 'authentic' popular genre, self-improvement books are suitable for promoting interest in reading among learners with limited proficiency because they are rich in reader-engagement elements. Drawing on Fu (2012) and Hyland (2010), my examination of reader pronouns, directives and questions in self-improvement books indicates that the genre has a strong reader-oriented character. These features acknowledge learners'

presence in the text and construct closeness with them. Also, these features construct learners as active participants. In other words, it can be said that the dominant function of these features is to demand readers' attention rather than to offer information (e.g., Kress & van Leeuwen, 1996). It seems reasonable then to propose that the active participation of learners that I observed can be attributed to this demanding function of these features.

Other engagement features that I have identified are stories and aphorisms. As learners are usually exposed to storytelling at a young age, their familiarity results in reduced burden and lower stress during the reading process. As mentioned earlier, stories in self-improvement books are usually not very long because rather than being individual 'complete' texts, they are embedded within the main text. Because these stories illustrate a particular message, they help readers to comprehend ideas in the main text more effectively. Alternatively, the main text provides relevant context (i.e., purpose of telling the stories) which in turn facilitates readers to understand the stories. In terms of complexity, stories in self-improvement books usually have plots that are relatively straightforward, compared to stories in novels, as those in self-improvement books are constrained in their lengths. For promoting interest in reading, stories in self-improvement books not only help readers to focus on the main ideas but also make reading texts from this genre a more manageable experience. Such positive experience is crucial for promoting confidence among learners with limited proficiency.

As stated earlier, my research shows that learners interacted with aphorisms in an active and meaningful way. They copied aphorisms that they found interesting into their notebooks on a voluntary basis. In a similar way, readers of self-improvement books also interacted with this feature by copying them down (Koay, 2015). These observations suggest that aphorisms in self-improvement books are suitable for meaning-focused reading activities. Also, as aphorisms are typically short and catchy statements, they make reading more manageable.

Limitations and future research
This study has focused on presenting the reader-engagement features in self-improvement books and how texts from these books can be used to promote interest for reading among learners with limited English proficiency. To enrich the understanding of the value of these features, future studies could investigate learners' experiences reading these materials by interviewing them. Findings from the interview data could enhance the understanding of engagement and this could further benefit teachers' practice in terms of material design and selection.

It would be interesting to compare how learners respond to texts from self-improvement books and those of other non-fiction genres that are not as rich in terms of reader-engagement features. Future studies could also investigate the vocabulary load of self-

improvement books to explore opportunities for vocabulary learning among learners with a limited vocabulary range. It would also be worthwhile to explore whether reader-engagement features compensate for insufficient vocabulary coverage, in other words, whether the features discussed in this paper can sustain readers' attention when reading texts with a higher vocabulary load.

Conclusion

For teachers who are teaching adolescent learners with limited English proficiency, particularly those with little motivation to participate in classroom activities, self-improvement books serve as ideal teaching materials for promoting interest in reading and active participation in the language classroom. The abundance of engagement elements (i.e., reader pronouns, imperative clauses, questions) in self-improvement books shows that these books have a reader-oriented character, which suggests that they are a highly engaging genre and have the potential to engage these learners. Other elements that make these books engaging are stories and aphorisms, as learners are typically familiar with them. Also, this genre allows learners to read and respond to topics that they are familiar with, thus reducing the burden in the reading process.

While prevailing methodologies for materials evaluation have been mainly perception-based, this paper has demonstrated how teachers can use discourse analytic tools to evaluate materials, particularly at the material selection stages. These tools allow teachers to make a more informed prediction regarding the engagement aspect of materials, and they provide teachers with a more objective methodology compared to those based on perception.

Notes

[1] Maxwell, J. *Talent is Never Enough* 2007, p. 209, © Thomas Nelson, reproduced with permission.
[2] Muncy, J. *A Few Keys to All Success* 2002, p. 29, © Jim Muncy, reproduced with permission.

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AFFORDANCES FOR HIGH SCHOOL STUDENTS LEARNING ENGLISH IN RURAL AREAS IN VIETNAM

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Abstract

English language education in rural areas in Vietnam is often claimed to exhibit a number of limitations regarding teaching quality, social support and facilities for language learning and teaching, thus challenging learners' resilience and motivation (Chinh, Linh, Quynh, & Ha, 2014; Kam & Wong, 2003; Vang, 2003). Drawing on qualitative data primarily from interviews and observations, this study examines the language affordances for students learning English in a rural high school in Vietnam. The findings reveal a diverse range of affordances within and across multiple learning settings, including formal language education, private tuition, and home support. It also shows the ways in which contextual constraints and affordances in rural areas contribute to shaping students' motivation to learn English in their own settings. This study responds to growing concerns in relation to language education in rural areas and provides further insights into resources and support beyond the classroom. The article concludes with implications for language teachers in promoting students' agentive utilisation of affordances available in their learning contexts.

Introduction

With English gaining traction as a *lingua franca* as a consequence of globalisation and technological development, English language education has become an endemic concern across ESL/EFL countries. In Vietnam, English is considered the premise for its successful incorporation in the world economic market (Wright, 2002). The vital role of English is evident in its position as a mandatory subject in the national secondary school programme since 1972 (Vang, 2003), and from Year Three in major urban primary schools since the 1990s (Hoa, 2011). Some tertiary institutions in Vietnam have also started to implement English as a medium of instruction in a number of their programmes (D. T. K. Anh, Hoa, & Truc, 2013). Given the strategic importance of English, the Ministry of Education and Training, Vietnam, launched the national foreign languages 2020 project, aiming to enhance the quality of language teaching and learning at all levels of education across Vietnam. However, an issue confronting Vietnam's foreign language education as well as that of many Southeast Asian countries is the disparity in the effectiveness and efficiency of English language programmes between rural and urban areas (Chinh et al., 2014; Goh & Bang, 2004; Hayes, 2010; Kam, 2002; Kam & Wong, 2003; Vang, 2003). Limited access to facilities and support for language studies results in relatively low language proficiency and low levels of interest in learning English among the majority of learners in rural areas. Therefore, more detailed understandings of the

resources, or *affordances*, available for English learning in rural areas, and of language learning outside the classroom, could better inform the development of teaching approaches, school-home cooperation and educational policies relevant to local contexts.

Affordances for language learning

The construct of affordance was developed by American psychologist James Gibson. In his words, "the *affordances* of the environment are what it *offers* the animal, what it *provides* or *furnishes*, either for good or ill" (Gibson, 1986, p. 127, italics in the original). His definition is based on the premise of the reciprocal relationship between an organism and a particular feature of its environment. With regard to L2 learning, van Lier (2000, p. 253) states that the environment provides rich opportunities and resources for "the active, participating learner". Affordance is seen as a better alternative term for the notion of input because "what the learner takes from the input is not that much determined by its quality but by what the learner intends to take from it" (Lankiewicz, 2011, p. 237). This means that language is not a fixed code to be acquired through formal education and interpersonal interactions. Rather, learning a language is a process in which learners "construe and construct it" along the way (van Lier, 2004, p. 90).

Drawing on the construct of affordance, Menezes (2011) explored the resources and support available for English learning outside the classroom among international learners from Brazil, Finland and Japan. Her analyses suggested that English language affordances were ubiquitous in almost all settings, from the home (via cultural products such as books and movies) to the workplace and international travel. However, affordances were not necessarily available for use, even in English-speaking countries or English classes, but rather emerged from language use through learners' interactions with others in social practice. Menezes (2011, p. 71) concluded that "learners must be empowered to perceive affordances [around them]" and "schools alone cannot gather all the necessary affordances for language development and we must open our students' eyes to the world around them". Her argument highlights the need to gain further insights into contextual affordances beyond the confines of the language classroom and the ways students utilise them. These are the main points that the present study focuses on.

The study

This study aims to explore the affordances in multiple language learning settings in rural areas in Vietnam and how these resources are utilised through examples from students learning English at a high school. It draws on qualitative data collected from a combination of methods and tools in different settings, including the school, participants' homes and private English classes.

The school setting

The study was conducted at Magnolia High, a rural high school in Southern Vietnam. It has approximately fifty staff members, including six teachers of English who held BA degrees in either TESOL or Applied Linguistics, and approximately a thousand students. Magnolia High performs the usual function of a Vietnamese high school, namely educating students from Year Ten to Twelve whose ages range from 15 to 17, and follows the national curriculum for general education. An average class often has over forty students with one form teacher who supervises the class's academic and social activities. The school comprises thirty-one classrooms, one computer lab, and one language lab shared among all classes. Students learn English in the same classrooms as other school subjects, with fixed seating arrangements, making it difficult for interactive activities. The weekly timetable for English comprises three formal sessions of forty-five minutes in the morning shift and two extra sessions in the afternoon shift.

Participants

Participants in the present study were ten Year Ten students in their second semester at high school. They were 15 to 16 years old and had been learning English for four to seven years. Their English proficiency levels ranged from elementary to pre-intermediate. In addition to formal language education, some students who came from more financially comfortable families were sent to private English classes at their teachers' homes and/or courses at foreign language centres. Table 1 below provides further participant details:

Table 1:
Participants' biodata

Participants (pseudonyms)	Gender	Age	English learning duration (years)	English proficiency	English learning settings		
					school	private teachers' homes	foreign language centres
Hanh	female	16	4	elementary	✓	✓	✓
Hoa	female	16	4	pre-inter	✓	✓	
Hung	male	16	4	elementary	✓		
Manh	male	16	4	pre-inter	✓		
Minh	female	16	4	pre-inter	✓	✓	
Phong	male	17	4	pre-inter	✓		
Sim	female	16	7	elementary	✓	✓	
Tho	female	16	4	pre-inter	✓	✓	
Tuan	male	16	7	elementary	✓	✓	
Tuyen	female	16	4	pre-inter	✓		✓

Data collection procedures

Data were collected primarily from observations in multiple settings and interviews based on social practice approaches which emphasise the process and contextual elements constituting the interview and meaning co-construction between the interviewer and interviewee (Talmy, 2010). On-site data collection spanned six months, followed by online Skype communication with some of the participants for further clarifications after the researcher had left the field. Upon receiving approval from Magnolia High's stakeholders, the researcher visited all Year Ten classes at the school to introduce the study and recruit participants. Interested students contacted the researcher for further discussions of participants' rights and benefits, and to set up private English tuition at their homes. Consent was obtained from parents prior to working with the students.

In addition to classroom observations and informal interactions with the participants at school, the researcher went to their homes once a week for one-on-one or group private tuition. This activity was part of the researcher's reciprocal approach to establishing rapport with the participants and, ultimately, provided good opportunities for observation of their language learning in the home setting as well as more interactions with them and their family members. Such observational and interactional data were the basis for developing interview guides to gain further insights into the language affordances available to each learner in their own contexts. For example, through interactions with Manh's parents during one-on-one private tutoring at his home, the researcher discovered that his father had taken an English language major at college and had been helping him with his English studies at home; thus, in addition to questions that were similar to those with other participants, further points related to Manh's English practice with his father were included. Four interviews were conducted with each participant over the data collection period, in various formal and informal settings, such as in the school yard after their class sessions or at their homes. Interview data were coded as **I** plus the student's name (e.g. ITuan) and observational data as **O** plus the student's name (e.g. OHoa).

Findings

Language learning at school

Within the local rural context, school teachers of English were the primary providers of language affordances and acted as language sources themselves. However, the constraints of large class size, lack of dedicated facilities for language teaching and learning, and students' low language proficiency had strong impacts on their teaching approaches and focuses, provoking varying perceptions of the motivational value of formal language education among the students.

Most of the participants stated that language teaching at school aimed to cater for the needs of the majority of students who performed relatively poorly in English. This was because they shared the same test and examination questions with students from other

suburban and urban areas who seemed to have better learning conditions and language abilities. Their teachers had to ensure that these students were able to achieve at least a passing grade in accordance with the school's academic targets across disciplines. Consequently, most teachers tended to focus on test preparation which predominantly covered grammar, vocabulary and reading skills, and to overlook communicative components in their teaching. In this regard, Tuan said:

> Lessons only cover the basic knowledge in the textbook and teachers move forward without much revision of previously taught points...There are very few listening and speaking activities...If I want to get more revision and practice, I have to take private classes. (ITuan)

It is evident that most language classes at school chiefly emphasised textbook knowledge to prepare students for examinations with little attention to individual progress and needs. Also, the lack of skill development in other language areas led some students to resort to private tuition as discussed later. However, this does not mean that all local teachers had the same teaching approaches. There were still teachers who paid particular attention to students in need or carried out various activities to enliven the class atmosphere. On this point, Phong's teacher tried to help low-achieving students to keep up with their peers by providing more individualised support:

> She would ask my classmates who were very weak at English to sit in the front row in class. She would ask them to go to the blackboard to give answers to her questions more often than the rest of the class. Whenever she gave us a task, she would come and give them further explanations. After a few months when she saw their progress, she would ask them to go back to their original seats and a new group would replace them. (IPhong)

Although Phong did not receive as much support as these classmates, he felt that his teacher really cared about their overall progress; thus he expended more effort in his language study: "during the class session, Phong volunteered to answer many of his teachers' questions...during the private tutoring with me [the researcher], he asked me to introduce some exercise books on English grammar for him to work on at home" (OPhong). In the case of Manh, his teacher, realising the lack of opportunities for language learning outside the classroom, always encouraged students to use English in class by conducting a variety of communicative activities. His approach was giving compliments so that students could feel positive about their language abilities and creating close rapport by treating his students like his own children. Such a classroom environment enhanced Manh's confidence in volunteering to be a role model for conversational practice in class.

Despite the enthusiasm of these teachers, Manh and Phong as well as the rest of the participants insisted that language learning at school fell short of their personal language

needs and failed to help students to develop more rounded language skills. Also, the growing dissatisfaction with the quality of formal language classes contributed to students' low levels of motivation and resulted in a tendency to seek private tuition for further language learning opportunities.

Home support and resources
Through ready access to the mass media such as local newspapers, television and the radio, parents in rural areas in Vietnam became increasingly aware of the importance of learning English for their children's socioeconomic and academic future, and more involved in children's language learning, but to differing degrees. All the students in the present study reported that they received financial support for language learning from their parents in terms of buying additional materials for language practice, going to private classes at English language teachers' homes and, in a couple of cases of very financially strong families, taking courses at foreign language centres. In addition, their parents gave them frequent reminders about the need to attain a high level of English proficiency for future job applications, citing examples from the mass media and their neighbourhood peers. These were a great source of motivation for the students in their language learning, as Minh stated:

> My father usually tells me that English skills are essential for having a good job...When I have low scores, my parents do not scold me but encourage me instead...They allow me to take private classes too...I have to do my best so as not to disappoint them. (IMinh)

Concerns over English language study also spread to the participants' extended families. In Phong's case, he had been living with his grandmother who had helped his financially challenged parents to take care of both his studies and well-being since secondary school. The grandmother usually asked the researcher about Phong's English learning and made careful arrangements for the one-on-one private tuition meetings at her home:

> Each time I [the researcher] arrived, Phong's grandmother was usually lying in a hammock in the living room. A mug of fresh ice water had already been put there on the desk...After exchanging greetings, she quickly withdrew herself to the back house, leaving the whole space for us. (OPhong)

In addition to financial support, some family members who had competence in English played an enthusiastic role in creating an environment for communicative practice at home. Manh's father, who had attended an English teacher training college but quit soon afterwards for personal reasons, served as a conversational partner in daily interactions. Similarly, Phong's relative, who had recently graduated from a university in Ho Chi Minh City - the biggest socioeconomic centre of Southern Vietnam, gave him all her study materials and shared her language learning experiences with him.

To sum up, the students received diverse support from immediate and extended family members depending on their financial and language literacy backgrounds. These affordances partially fuelled their commitment to learning English.

Private English tuition
Although most students in the present study came from low-income families, their parents strove to support their private tuition. Among the ten participants, more than half went to private English classes at teachers' homes because the tuition fees were within their family budgets while only two of them could afford to take courses at foreign language centres. Their reasons for taking private classes and attitudes towards this practice and learning outcomes varied case by case.

Private English classes at teachers' homes
With private classes at teachers' homes, students had the flexibility in choosing to work with either their own school teachers or those from other schools, depending on their personal arrangements and the prestige of the teachers in the local area. The students who took these classes did so for different reasons: while the majority of them (Hanh, Hung, Sim, Tuan and Tho) were falling behind in their formal classes and desired more individualised support from private teachers, some students (Tuan and Hung) were particularly interested in learning English and wanted to explore it further. In the case of Minh, her father's former classmate worked as an English teacher and thus he sent her there for extra language practice. Private classes might take place in any space at teachers' homes that could accommodate students. The teaching approaches generally resembled those at school, with few oral and aural activities and were exam-oriented; however, the students received more drills and attention from private teachers due to smaller class size and longer contact time.

Most students saw improvement in their language proficiency, leading to positive feelings about their language studies. As Tho said: "The private teacher helped me to revise the school knowledge and to prepare carefully for tests and examinations...when the school teacher gave me tasks to do and I could do them well, I felt excited" (ITho). However, for low achievers such as Sim, not being able to make progress in language learning despite taking private tuition caused her to feel negative about her learning: "Like some of my cousins, I also take private English classes but have not done as well as them. I feel inferior and do not really want to continue learning the language. I am sick of it" (ISim). In addition, some students tended to be reliant on private tuition and failed to make personal effort outside the formal and private classes, as Hanh stated: "After arriving home from my English classes, I would throw my school bag on the desk and that was all for the day. I wouldn't bother to review the lessons" (IHanh).

Private teachers' abilities and their teaching content appeared to contribute to shaping students' attitudes. In Manh's case, when he entered secondary school, his parents sent him to a private English class offered by a teacher in his neighbourhood who had retired from her work as a translator. It was a mixed-level class with about ten students, classified into smaller groups of similar levels but taught simultaneously. Manh noticed a marked lack of coherence between what he learned at school and in the private class, and the teacher's language deficiencies. Given these drawbacks within the class, Manh decided to leave it after the first month and expend more personal efforts. Although private tuition at teachers' homes provides additional language affordances for students, it has differing effects on students' language learning outcomes and motivation. While some students become more interested in learning English as they could make good progress, others showed signs of reliance on this practice or developed a sense of inferiority when they compared their own results with those of their peers. Also, the teaching quality and benefits of such private classes are not consistent, influencing students' decisions to either continue or withdraw from them.

English courses at foreign language centres
Hanh and Tuyen went to the same and also the only language centre in town, kilometres away from their homes. Tuyen started going to the centre during secondary school but ceased when she entered high school because her parents could not continue to support this activity. Thanks to the language courses there, Tuyen developed quite good speaking skills. Code switching between English and Vietnamese occurred quite often in most of the interviews with her. Commenting on the learning environment at the language centre, Tuyen said:

> It is very exciting with games interwoven in class activities, helping me to feel relaxed and understand the lessons more easily. The teaching approaches aim to create close rapport between teachers and students. Also, the class size is smaller than that at school, so I could receive a lot of attention from teachers. They help me to improve my pronunciation and intonation. (ITuyen)

Unlike Tuyen, Hanh went to the language centre much later, during her high school summer holiday. Hanh's mother learned of the positive effects of those language courses on communicative skills through casual conversations at work and decided to send her there. Both of the students agreed on the motivational value of these courses which were rich in language affordances and provided them with more individualised support, interactional activities and corrective feedback. The well-resourced environment and more learner-centred teaching approaches at the foreign language centre starkly contrasted with their formal learning setting, as Hanh stated:

> After going to the class for a while, I think I became quite keen on learning English. It was interesting. Even a shy student like me still wanted to open my mouth and talk in class. But then, when I went back to the formal class, the class

atmosphere was worlds apart. I felt intimidated with the teacher's approach and soon became bored with learning in it. (IHanh)

The differences between the two language learning environments resulted in Hanh's varied emotional reactions and her motivation to learn English. This also indicated the situatedness of her motivation in the face of contextual constraints and affordances. Evidently, students' access to private tuition and forms of private tuition chosen largely depended on their family financial backgrounds. The effects of private English classes and courses on their language development and motivation also varied case by case. Thus, there should be further discussion and cooperation among school teachers, parents and private teachers in terms of providing more individualised support for each student.

Table 2 summarises major issues, the complexities of English language teaching and learning in rural areas in Vietnam, possible solutions and ways forward in order to enhance the quality of learning opportunities and experiences within and outside the classroom. These activities primarily focus on helping students, parents, school stakeholders and policy makers to become more aware of the value of learning English. This could be achieved through establishing a platform for school and private teachers to share their concerns and challenges with education stakeholders at both local and provincial levels, and to determine possible action plans based on the resources available for language education. An important point to note is that the students in this study had been studying at high school for only one semester and their language studies were substantially impacted by teacher-centred practices at secondary school in Vietnam. Consequently, they tended to take a rather passive role in using language affordances available to them. As outlined in Table 2, teachers could address this issue by enhancing students' awareness of the resources available in the local context and encouraging them to conduct more autonomous study sessions outside the classroom.

Table 2:
Major issues, possible solutions and complexities relating to language education in rural areas and ways forward

Issues	Possible Solutions	Complexities	Ways Forward
Quality of formal language education	- More individual discussions between language teachers and students - More individualised tasks and homework - More family-school communication	- Local testing practices - Time constraints - Parents' lack of awareness of children's deficiencies and needs	- More focus on individual differences and needs - Enhancing parental awareness of the value of learning English

Inconsistent benefits of private English classes	- More communication between families and private teachers - More communication between school teachers and private teachers	- Some school teachers also working as private teachers - Formal education and private tuition as two separate worlds - Time constraints	- Annual local conferences as a platform for both school and private teachers to address their language teaching issues and identify ways forward
Inequality of access to private tuition and other language resources	- Encouraging peer learning and support - Encouraging use of free resources such as newspapers, the radio and television - Asking for language support from family members who are competent in English	- Student (lack of) resilience in supporting each other - Not many family members in rural areas are competent enough to provide language help	- Emphasising the value of language practice with peers - Enhancing students' awareness of the importance of learning English
Students' passive utilisation of language affordances	- More classroom tasks integrating use of resources available to students such as the mass media - Enhancing students' awareness that language learning not only takes place in class but also in other social settings	- Students learning English among other subjects in the curriculum - Students' low levels of interest in learning English - Students' low English proficiency	- Rewarding students for personal effort - Providing evidence of progress as an incentive
Inadequate support from education stakeholders	- Drawing stakeholders' attention to the constraints and challenges in language learning and teaching in rural areas	- Limitations in funding for English language teaching and learning - National education policies	- Enhancing stakeholders' awareness of the role of English in local and national socioeconomic development

Discussion and conclusion

As Ortega (2012, p. 219) notes, "epistemological diversity in and of itself has not led to a process of expansion in the knowledge base of what counts as the crux of best language teaching practices across a myriad of relevant contexts for language learning". In a similar vein, Allwright (2006, p.13) is critical of the search for "general solutions to general problems" and advocates "a recognition of the essential and irreducible complexity of the phenomenon of classroom language learning and teaching". For these reasons, this section will look at the findings in light of the ways in which language affordances contribute to shaping students' L2 motivation.

This study took place against a background of language teaching and learning at a rural high school in Vietnam, with limitations in formal learning conditions that are rather typical in many Southeast Asian countries (Hayes, 2010; Kam, 2002; Lamb, 2013). Drawing on Ushioda's (2009) person-in-context relational view of motivation which conceives of language learners as real persons with unique sociocultural backgrounds, this study shows a diverse range of language affordances as well as limitations contributing to shaping their L2 motivation within and across multiple settings and relationships. Given the contextual and methodological constraints of formal language education in rural areas, students tend to turn to private tuition for further language support (Lamb, 2007). However, not all students have equal access to private language tuition and learning opportunities outside the classroom (Butler, 2015a; Kam & Wong, 2004). While courses at foreign language centres appear to have positive effects on students' L2 motivation and learning outcomes, classes at private teachers' homes do not always meet their needs and expectations, suggesting inconsistencies in the benefits of private tuition (D. H. Anh & Rogers, 2008). With regard to family support, this study shows educational concerns across students' immediate and extended families, parents' increasing awareness of the value of learning English and their proactive involvement in language learning. In addition to financial investment in children's language learning which is typical of families in rural areas (Lamb 2012, 2013), parents who have English abilities tend to actively create opportunities for language practice at home. Such parental support contributes significantly to learners' language development and L2 motivation (Butler, 2015b; Gao 2006, 2012; Palfreyman, 2006, 2011).

In conclusion, this study provides a glimpse of the affordances and constraints in language education in rural Vietnam within and across settings and relationships, and how these elements impact on learners' motivational constructions. It also proposes possible solutions and ways forward, emphasising the value of collaboration among all key stakeholders, such as school teachers, private teachers, parents and policy makers, in addressing the prominent issues in local English language teaching and learning.

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GOOGLE DOCS AND ENGLISH LANGUAGE LEARNING: REFLECTIONS FROM A SECONDARY SCHOOL ESOL CLASSROOM

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Abstract

In response to the introduction of a school-wide Bring Your Own Device (BYOD) initiative at my secondary school I set myself an inquiry question: What affordances do Google Docs offer for strengthening the writing of English language learners (ELLs) in my Foundation Stage ESOL class? I observed classroom interactions and interviewed students. The findings suggest that collaborative work on Google Docs provides opportunities for meaning making and language learning only if students working together are at similar levels of English language proficiency and/or share first languages (L1s). The students commented that the grammar and spell-check functions helped them to notice errors and to reflect on alternative constructions. However, students' technological dexterity when interacting socially in L1 did not automatically transfer to L2 academic settings.

Bring Your Own Device (BYOD) in an immersion class

Immersion classes focus on orientation to New Zealand school culture while preparing learners to cope with mainstream curriculum language. In the immersion class described in this article there were 14 Year 9 to Year 12 migrant and international students. They came predominantly from Samoa, Fiji, South Korea, China and Japan. While the students were at varying levels of English language proficiency and digital literacy, they were generally at Foundation Stage on the *English Language Learning Progressions* (ELLP, Ministry of Education [MoE], 2008). At this stage of their writing "sentences show frequent or repeated use of a restricted range of (learned) modelled structures. Sentences are simple or compound...Most words are high frequency, and there is little topic-specific vocabulary (unless it has been provided)" (ELLP, MoE, 2008). In response to the introduction of a school-wide BYOD initiative I aimed to accelerate the students' writing progress by planning writing tasks using collaborative pair work and BYODs.

Many New Zealand teenagers are technologically literate with regard to social networking and have access to mobile devices as everyday tools (Wright, 2010). Consequently, it seems logical for schools to institute school-wide BYOD approaches, and for the MoE to endorse such approaches. Students bring their own devices and connect them to the school's wireless network affording, the MoE claim (2012, p.10), substantial educational benefits for both teachers and students. While much has been

written to identify mobile technologies as having a great significance for education in terms of improving levels of student engagement and motivation in general, there is a lack of research addressing the impact of information and communication technology (ICT) on ELLs at foundation level (Shaw, 2008). My school's BYOD initiative with its school-wide shift to utilise Google Drive and Apps in teaching and learning prompted an investigation into the affordances that Google Docs offer for strengthening the writing of the English language learners (ELLs) in my Foundation Stage ESOL class. I was interested to explore time spent and also the opportunities for learning from peers, hence questioning the impact that online collaboration has in facilitating peer revision and L2 writing for my students. Writing in a Google Doc is not an affordance per se, but writing in a Google Doc can enable the affordances of idea sharing and the development of language learning through interaction both in oral and written modes. As the ICT initiative was new, only Year 9 students were expected to purchase a Chromebook or equivalent, while older students had access to laptops supplied by the ESOL department.

A computer-supported collaborative learning (CSCL) environment can take the form of distant or face-to-face interaction (Stahl, Koschmann, & Suthers, 2006; Goodyear, Jones, & Thompson, 2014). For instance, students may create content either together on one computer or on their individual computers separately using Google Docs, which could be an extension of face-to-face interaction. One major benefit for adopting a CSCL environment is that the process of writing in such an environment could lead to more comprehensible student outputs. Lee (2001) states that delayed responses allow L2 learners to see and correct errors (cited in Liang, 2010). For learners who are shyer, have low proficiency in the English language or have poor typing speed, synchronous communication will appear to be rather daunting (Chien & Liou, 2002). In this case, students are provided with the flexibility to manipulate the extended time provided to improve their writing while working asynchronously (not occurring at the same time). For instance, my Japanese student corrected his spelling mistake "vely" with the help of the spell-check function in Google Docs, and with the help of immediate peer feedback, my Korean student revised his word choice from "dirty writing" to "messy handwriting". In the case of my Chinese student, her partner edited her sentence "There *have* interesting places..." by changing it to "There *are* interesting places..." In this environment, learners are forced to think, construct and reflect collaboratively on how to best express their intended meaning (Swain, 2006, 2010). While richer face-to-face communication may be preferred by students who do not share a mother tongue, asynchronous communication allows students to take their time writing without the pressure to respond immediately; they can reflect and rewrite (Goertler, 2009; Swain, 2006, 2010).

Facilitating conditions for ELLs using ICT: A glance at theory
Digital technologies are recognised as improving levels of second and foreign language learners' engagement, motivation and language learning opportunities at tertiary level

(Chapelle, 2000; Kern & Warschauer, 2000; Kessler, 2006). Collaborative online writing has been widely researched at tertiary level (Schultz, 2000), particularly the role of peer feedback on online writing (Chang, 2012; Ho & Savignon, 2013). Schultz's findings from a second-year intermediate-level French writing programme have relevance because Schultz's study concluded that while advanced students benefitted most from a mixture of computer and face-to-face interactions, less advanced students benefitted more from face-to-face interaction. Chang (2012) reports similar findings: learners with less advanced second language writing proficiency working in asynchronous collaborations are less likely to meet partner's expectations or needs.

Chang (2012) and Schultz's (2000) cautions around effective conditions for tertiary lower-level student learning are echoed in the literature on secondary and primary school studies. In general, two conditions are seen as essential for digital learning to be effective for younger learners. Firstly, learners must possess basic computer skills enabling them to manipulate network sites and templates to create content individually or collaboratively (Shaw, 2008). Secondly, learners' communicative skills must be at what Shaw describes as "proficient levels". Learners at this level are capable of initiating dialogues with teachers and other learners. Shaw claims that such proficiency enables comprehensible input, provided the students are motivated. Shaw suggests that ELLs at the early stages of language learning "don't have time for that" (p. 201), i.e., to learn language independently of the teacher using technological devices. Instead, form-focussed and meaning-focussed language learning can be enhanced by not only face-to-face but also one-on-one opportunities (Shaw, 2008). Chapelle (2000, p. vii) also contends that "second-language teachers today need to be able to choose, use, and in some cases, refuse technology for their students". This may apply to those who lack basic computer skills and are beginner level writers.

In addition, teenagers' technological literacy is possibly driven by their need to network socially (Leung & Lee, 2012), and their resultant technological literacy may be in quite narrow contexts (Hargittai & Hinnant, 2008). Furthermore, the increased use of the Internet to interact on social networking sites or online games does not necessarily lead to increased skills in information literacy (Farmer & Henri, 2008) and tool literacy (Shapiro & Hughes, 1996).

Principles from the second language acquisition (SLA) field can inform a CSCL environment. While research and theory do not offer an uncontested account of how teaching can best facilitate language learning, these principles have relevance in a CSCL environment. For example, Ellis (2005) outlines six principles: focusing predominantly on meaning; ensuring that learners also focus on form; taking into account the learner's 'built-in syllabus'; providing extensive L2 input; providing opportunities for output; and the critical opportunity to interact in the L2. To elaborate on the last three listed

principles, teachers can expand learners' opportunities for input and output by exploiting CSCL's potential for both independent and collaborative work in both synchronous and asynchronous spaces. Teachers can draw on students' familiarity with, and motivation to use, digital devices as well as their proficiency in their L1s when planning such opportunities (Warschauer, 1996, 2006). CSCL's dual functionality is its strength. It can facilitate collaboration yet also enable the development of independent inquiry skills. Appropriate and meaningful integration of e-networked tools into student learning activities has shown richer and deeper forms of interaction, dialogue, and sharing of ideas among students and between teachers and students (Lee & McLoughlin, 2007). This promotes "learner discovery and research, and active student involvement in the knowledge creation process" (McLoughlin & Lee, 2008, p. 18). Lee and McLoughlin (2007) state that using Web 2.0 is one way to raise the quality of students' writing. For instance, a wiki enables student input to be readily shared in a private virtual space and sometimes to a broader audience if made publicly available. In addition to creating initial content, students also perform the roles of editing, revising, and organizing the content, which become part of the shared pool of resources accessible to all learners. Zheng and Warschauer (2015) contend that language acquisition is made possible by the provision of an authentic audience for students' writing or speaking output, giving students the opportunity to get immediate feedback, and facilitating more equal participation of shy or reticent students (Warschauer, 1996, 2006, 2011).

Norton and Toohey (2001) caution against the positioning of students in terms of power (dominant or subordinate roles in interactions) and how this may affect subsequent opportunities to engage in learning conversations. Would opportunities for language use benefit writing for all in a CSCL environment? Or would certain students continue to dominate interactions? With this in mind I began the initial teaching and research stage: introducing students to paired research and writing tasks using Google Docs.

The initial research phase: Observation
In the initial observational phase of this small-scale inquiry, I found a disparity in technological literacy between the migrant students and the international students. Some of the migrant students had to be taught basic computer literacy skills such as turning on and shutting down a computer, creating and saving files, e-mailing and keyboarding skills. Some of the international students, on the other hand, were unfamiliar with the English keys and toolbars.

I introduced the class to Google Docs and observed their writing practices as they discussed and wrote an information report about their home countries. Students worked in pairs (in most cases I was able to match the students with a partner who spoke the same language) to collate relevant information and details on a shared Google Doc. In pairs, students had to carry out research on their home countries and produce a written report

based on the information researched: 1) land area, 2) population, 3) main ethnic groups, 4) important festivals/celebrations, 5) popular food and 6) places of interests. My observations suggested that students used the Google Doc as if it were a piece of paper, as in the case of a face-to-face writing task, although meaning-making was facilitated by the use of online translators and dictionaries. The provision of immediate search results and better understanding through computer images made it easier for students to complete sentences by using correct vocabulary, sometimes with the teacher's help. For example, in trying to complete the sentence, "The most popular food in my city is…", when the student showed me an image of a Sichuan Hot Pot and asked for the English name of this dish, I was able to guide a student to look up the words "spicy" and "hot pot" using an online translator and dictionary. This student subsequently used these words to describe the dish in his report.

Although looking up appropriate vocabulary was made easier by Internet use, my students did not maximise the benefits that Google Docs could offer to collaborative writing tasks. Instead, the interaction during the online collaborative writing task was dominated by social talk and content discussion rather than meaning negotiation, error correction and technical actions (Liang, 2010). Throughout the preparation stage, students mostly talked with each other and then wrote down what they had discussed on the shared document. They neither communicated via the chat or comment function nor indicated their opinions and/or ideas by typing on the shared document. Even the more active participants told their partners what to do face-to-face, instead of posting digitally. For instance, a student yelled across the classroom instructing his partner to change a word in his sentence instead of editing that sentence on his own. I also noticed that instead of working synchronously on individual computers, students moved their seats to talk (face-to-face) about what they needed to research on, split the job up and then inserted their findings on the Google Doc individually. I was not prepared for this response as I expected my students to find out the information about their home countries individually, and then insert the information into the Google Doc synchronously in a collaborative manner without having to specifically "split" the job up right at the start.

At the writing stage, I noticed that peer editing and feedback were limited and were mostly confined to correcting spelling mistakes and the use of capital letters for sentence beginnings especially by the weaker students. I also noticed that the more dominant and/or able students did most of the work. The subordinate and/or weaker students did not jump in to edit or post comments on the writing. Their contribution to the written work was almost negligible. In some ways this phenomenon in the CSCL setting mimicked face-to-face class discussion whereby the more dominant and/or able students volunteered to contribute actively. Without teacher intervention, the subordinate students in a CSCL setting were often not called upon for their input. Perhaps the less dominant students needed to be explicitly told that the rules for turn-taking, interrupting or

disagreeing differ in an online collaborative writing situation, and I needed to sensitise all students to the importance of creating spaces for all to participate by reminding the more dominant students of the need to encourage and allow input from their partners. It was noticed that the weaker students were willing to contribute more through face-to-face talk when given the opportunity to use their L1, but they did not write collaboratively in the L2 in this digital context. They were slow to create sentences or had their sentences heavily edited or deleted by their partners. As previously mentioned, they hardly edited their partner's work. The weaker students may not have been ready to take up the challenge of editing their partner's work in distant online collaboration because of limited digital literacy, and/or limited L2 proficiency. Observations at this stage appeared to show that the opportunities for language learning in this CSCL context were not being maximised for all students.

In the second phase of the research, students focused on a series of tasks to plan an overseas trip for the class. Working in pairs, students were expected to produce a simple travel guide for a chosen city. Researched information such as the cost of accommodation and food, tourist attractions and activities, and visa requirements had to be presented in note form in a table. To complement this data, students had to write a descriptive paragraph introducing the city in a Google Doc. I discussed the importance of each student's contribution and explained how they could contribute. At the outset of the writing task, students were instructed to try their best not to communicate face-to-face, but to use the comment or chat function in the Google Doc. They were also told that they could improve the sentences written by their partners by changing, adding or deleting details. They could also use the online thesaurus to replace vocabulary or add details and descriptions to any parts of the writing. This phase of my inquiry included ethnographic observation, a focus group discussion and individual interviews with three students (Eric, Kriss and Florentine) from different cultural backgrounds. The interviewed students were selected based on their higher level oral and written contributions in online tasks and their ability to communicate ideas orally.

Table 1:
Student profiles

Pseudonym	Eric	Florentine	Kriss
Gender	male	female	female
Age	16	18	16
Year level	11	12	11
Country of origin	Uruguay	Japan	China
Number of years studying English	4 years	3 years	7 years
Time spent studying in New Zealand	4 years	1 year	2 months
Language used at home in country of origin	Spanish	Japanese	Chinese
Language used in the New Zealand homestay	Spanish	English	English

Phase two: Research findings
Benefits and problems of using Google Docs
The three interviewees were clear that using Google Docs had benefits. They liked the spell-check and save functions and being able to use the docs synchronously or asynchronously to build their shared text. The spell-check function in Google Docs helped them notice errors and offered possible corrections. For example, Kriss stated: "...and if my word spell [is] wrong, a red line will appear. This will help me to write sentences". Eric made a similar comment: "When you spell something wrong, it becomes underline[d] with the red line and then you correct it". The interviewees seemed to appreciate this function as it provided immediate feedback, helping them to notice and reflect on spelling and syntactic errors. The students felt that using these form-focused functions meant less time was wasted, which enabled them to spend more time creating content.

In addition, Google Docs allowed immediate peer checking and sharing of ideas about content and sentence construction asynchronously. Participants recognised, not just the value of peer collaboration in learning, but the fact that collaboration and learning could happen when they were physically apart. For instance, Eric stated: "I will just do my bit [at home] and then he will mark and see if he agrees with it." Florentine commented: "Yah yah yah and if like this [student signals distance with her hands by pointing in two different directions] we can work also."

Another valued function of Google Docs was work being saved automatically in students' Google Drives. They did not need to look for lost work and could retrieve information with ease, not limited by location and/or distance. For example, Florentine mentioned: "I think Google Doc is…most useful point is protect not protect automatically information save. Students forget their notes but that automatically keep information and if we use that we can share."

However, the efficient and successful use of this writing tool was not without its limitations. One major problem experienced by interviewees was difficulty in recognising and understanding the functions in the taskbar of a Google Doc, although the school had run a block course for all students on computer skills. This unfamiliarity added more stress to their learning and their output was compromised in that they wasted time sorting out these functions instead of getting on with writing. They had used Microsoft Word in their native languages but found it challenging to use the English version of Microsoft Word or Google Docs. This was perplexing as I had assumed that students would be able to work out the functions by way of comparison. When queried, Florentine responded: "I think yah similar but I don't know what they are." Kriss added: "I don't know because I don't know what these are." Although Eric had some knowledge of what some functions meant in everyday English, he did not know their meaning in a

computer field. For instance, he said: "I know what *insert* means. But dunno what it does here." This suggests that the toolbar language transfer from L1 to L2 is not a straightforward matter, that the words have similarities, and that these similarities cause confusion for the students. As ELLs at a Foundation Stage, the students were struggling to learn English for their core curriculum areas. Was it effective use of their time to be taught the language of computers at this early stage in their English language development?

Despite attempting to alert students to the beneficial learning role of working with a partner with weaker English language skills, the interviewees continued to problematise this issue. Students said that, in a CSCL context, they found it more difficult to understand what their partners were trying to say. In an asynchronous CSCL environment particularly, students have more limited semiotic means (ways of communicating). As a result, the stronger ELLs reported they did most of the work themselves with little input from their partners. Liang's (2010) findings reveal that "given differences in individual competence (e.g., L2 proficiency, content knowledge, and group skills) and task requirement (e.g., short essays versus long research papers), certain students may not be able to adopt peers' suggestions in revision" (p. 56). For example, Florentine commented: "Here has new students very much always coming so if the people are Japanese or Chinese and if she can't say English very much we can't conversation and she can't write so I will do everything." Eric was more brutal: "Uh….I will delete his thing and write myself."

The interviewees felt that they did not learn as much when they marked or edited their partner's writing compared with their work being corrected by a teacher. It would appear that they perceived peer learning from distant online collaboration as ineffective. They felt face-to-face talk would enable negotiation of meaning. For instance, Eric commented: "He's trying to say something but I don't understand what he's trying to say so... to make facials to show them what we're trying to say." In this sense, the benefits of distant online collaboration were not realised. As Norton and Toohey (2001) found, students positioned in subordinate roles were afforded few opportunities to make meaning. In these cases their writing was eliminated or disregarded. Without opportunities to focus on meaning (Ellis, 2005), learners are less likely to be engaged in decoding and encoding messages. Learning frequently takes place when there is comprehensible input and Eric and Florentine did not recognise their partners' contributions as being comprehensible. With opportunities for face-to-face communication minimised, as in the case of distant online collaboration, the students failed to see any benefits in working with someone with lower English proficiency. They believed having similar levels in writing and speaking, or a shared mother tongue, to be essential in an online collaborative writing task using Google Docs. For example, Eric commented: "Oh same level is easier...Because we both know what we are trying to say and we can understand each other more". Florentine also said:

"Have less stress to try to understand what he's trying to write" and "When I write down, my partner will know what I write and she can check it and we can share idea and work together...is very useful". Both students preferred working with someone who had similar writing skills as there was less mental effort required to make meaning of what their partners were trying to convey.

Further data were obtained from the participants to find out what might be the solutions for the above-mentioned challenges.

Students' solutions for problems encountered while using Google Docs
As mentioned previously, the interviewees found it challenging to understand the functions in the taskbar of a Google Doc. To counter this problem, they suggested that it would be ideal if they were taught how to use those functions as and when needed, rather than having to rely on what they saw as information overload in the school's block course on computer skills. They liked the way they had previously been taught to insert tables in a Google Doc. For example, Eric commented: **"**Oh Miss K teach me how to use it in class by teaching me the steps to go in it. Because there was easy steps into it." Kriss also suggested: "Teach slowly. If we need to use a table this lesson, then you show us step-by-step how to make one. If we need to insert pictures then you can teach us again." This suggests that a hands-on, step-by-step approach to learn one function at a time in a teacher-led lesson would be effective. To reinforce the new knowledge learnt, this needs to be complemented with opportunities for practice. When attendance at a block of IT lessons on Google Docs was proposed students rejected it unanimously. They understood that input and learning need should be matched. Florentine stated: "If all things learn in computer class, will forget." The thought of having to learn English computer language on top of their huge English language burden in terms of their curriculum subjects was stressful and time consuming, and they just "don't have time for that" (Shaw, 2008, p. 201).

The students perceived that motivation and need are powerful learning factors. All of the participants stated that to be motivated and thus effective, they preferred someone with similar English abilities to work with in a distant online task: "Because we both know what we are trying to say and we can understand each other more and we can correct each other's work. Help each other" (Eric). Florentine stated: "For me, if similar English level, we can talk in English and can work together, so that's good for me." Participants noted the importance of choosing the right partners in order for them to learn effectively and to enjoy the tasks. As mentioned previously, perhaps grouping students in a distant online task has to be different from that of a face-to-face collaborative task since the processes and skills involved are different.

Implications for my teaching practice

I hoped to understand my classroom practice more closely and through dialogue with my students to improve opportunities for language learning in my classroom. The following implications centre on knowing the learner well and emphasising the teacher's role in assigning and explaining roles to students.

The critical role of needs analysis

This study emphasised that digital literacy, including computer literacy, information literacy and computer-mediated communication literacy must be taught in response to learners' needs. The learners may be technologically savvy with their tablets or smart phones, but I should not assume that they know how to navigate commonly used programmes in English or search and select reliable information on the Internet. Instead, I should find out their needs and skill level through teacher-learner conferencing. This could be done through a questionnaire but considering the backgrounds of my students, conferencing is less stressful than filling in questionnaires where they may struggle with the language used. It also has the advantage of yielding richer, less rigid responses compared to questionnaires with set questions which are open to different interpretations by different respondents (Cohen, Manion & Morrison, 2011). Questions to ask could include: Did you use a computer in your previous school? What writing programmes do you use? What kinds of writing do you use them for? Have you used the English version before? Have you used any Google Apps before? Do you know how to use the Internet to search for meanings, translations and pronunciation of English words? Do you know how to create tables or insert images in your writing? Essentially, the questions would be geared towards finding out the digital literacy level of my students.

Matched pairing in an online environment maximises reciprocal learning

Careful pairing is critical to maximise reciprocal learning, which is highly dependent on group makeup and the dynamics between partners (Liang, 2010). Students with weaker language skills were in danger of having their voices obliterated by their stronger partners. The findings from my three interviewees show that my students were only prepared to engage in meaning negotiation if the peer had a similar level of language ability. Therefore, I will need to alert students to their own teaching and learning roles in collaborative settings. First, I will need to have a good grasp of their language ability and needs before pairing them up. Modelling peer response strategies to show what peer revision means and how it works, and making chat transcripts available, especially for the less experienced students to learn diverse ways of interaction, would be useful (Liang, 2010). This will also help to define the roles that students play in an online task. Finally, I will inform my students that their online collaboration can continue outside the class.

Limitations

The research findings are relevant for these students at this time and are limited to only three learners. BYOD is a newly introduced policy at my school and, with time, technology will improve and undoubtedly an increasing number of classrooms will become more digitalised nation-wide at earlier stages. These phenomena will have a direct impact on how ICT affects student learning.

Conclusion

The three focus group students interviewed had stronger English skills than many others in the class and noted the negative consequences when paired with partners with lower English skills, echoing Shultz's (2000) findings. Unwilling to scaffold the learning when working with a weaker partner, two learners assigned their partners to a non-participant role, affording their partners no opportunity to practise and improve their writing skills. They were not sensitised to the helpful role they might take on as a more expert partner. As Norton and Toohey (2001, p. 318) found, the learners' English language development was "bound up not only in what they did individually but also in the possibilities their various communities offered them". In this Foundation Level immersion class, stronger students such as Florentine were so focused on their own struggles to learn that they do not have spare resources to help those who were struggling even more.

Kirschner, Paas, and Kirschner (2011) contend that, by working collaboratively, students not only share their cognitive capacity, reduce their mental efforts, but also increase their confidence in the task, which may in turn lead to better affective outcomes, especially in processing complex tasks. This study showed that only when working with partners of similar level and language groups were the three interviewees prepared to acknowledge the learning benefits of collaborative work claimed by many.

For Foundation Stage students in this high school context, there had to be a basic level of digital competence before collaborating effectively in distant online tasks. The skills required and the processes of such collaborations are different from face-to-face collaborative or individual work using the computer. As Liang (2010, p.45) states, teachers "…may need to proactively model, scaffold and support revision related online discourse if it is to be of benefit."

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REPORTS

INVESTIGATING A SCIENCE VOCABULARY LIST IN UNIVERSITY MEDICAL TEXTBOOKS

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Context and motivation for the study

This research report focuses on further research into the nature of technical or specialised vocabulary in the sciences. The motivation for this study is the large amount of vocabulary learning required in the sciences at secondary school (Coxhead, Stevens & Tinkle, 2010) and at university (Coxhead, 2000; Coxhead & Hirsh, 2007). The English for Academic Purposes (EAP) Science List (Coxhead & Hirsh, 2007) was developed to assess whether there is a body of vocabulary which occurs outside the first 2,000 word families of West's (1953) General Service List of English Words (GSL) and Coxhead's (2000) Academic Word List (AWL). Chung and Nation (2003) found that around 30% of the vocabulary in a university-level Anatomy text is technical in nature. If a word list of technical vocabulary can help ease the learning burden of these texts by identifying commonly used and frequent lexical items, then learners and teachers will have a useful resource to draw on. Our interest here is in the coverage of the EAP Science List over two specialised medical textbook corpora.

This corpus-based study draws on the Pilot EAP Science List developed by Coxhead and Hirsh (2007) using a corpus of first year university level Science texts. See Appendix 1 for the headwords of the EAP Science List. Coxhead, Stevens and Tinkle (2010) investigated the Coxhead and Hirsh (2007) list using a corpus of secondary school science texts. In the present study, we extended the analysis of text coverage by the list to university medical textbooks. It is important to note that these textbooks are widely consulted by undergraduate and graduate medical students, as well as health professionals. Data for this report study comes from Quero's (2015) PhD research on the vocabulary load of medical texts.

The EAP Science List

The EAP Science List (Coxhead & Hirsh, 2007) was developed from a corpus of fourteen first year subject areas in the Sciences. These subjects are: Agricultural Sciences, Biology, Chemistry, Computer Science, Ecology, Engineering and Technology, Geography, Geology, Horticulture, Mathematics, Nursing and Midwifery, Physics, Sport and Health Science, and Veterinary and Animal Science. Each subject area of the corpus contained around 125,000 words, meaning the whole corpus contains 1,750,000 words. Seven of the subjects come from Coxhead's (2000) academic written corpus and seven more were added. The unit of counting for this list was word families, following on from

Coxhead's (2000) Academic Word List study. Three examples of word families of the EAP Science list up to Level 7 (Classical roots and affixes) are in Table 1 below:

Table 1:
Three word families from the EAP Science List (Coxhead & Hirsh, 2009, p. 72)

converge	diagnose	molecule
converged	diagnosable	molecular
convergence	diagnosed	molecules
convergences	diagnosing	biomolecular
convergent	diagnoses	biomolecule
converges	diagnosis	biomolecules
converging	diagnostic	intermolecular
	diagnostically	intramolecular
	diagnostician	macromolecule
	diagnosticians	macromolecules
	diagnostics	
	undiagnosed	

Selection criteria for the list items included range, frequency, and dispersion of the word families in the subject areas and corpus as a whole. For more on the details of the study, see Coxhead and Hirsh (2007).

The EAP Science list contains 318 word families and covers 3.79% of the university science corpus (Coxhead & Hirsh, 2007), suggesting it was a useful starting point for specialised vocabulary after the first few lists of Coxhead's (2000) AWL for EAP learners with science goals. The researchers divided the list into six sublists. The EAP Science List covered 0.27% of a fiction corpus (Coxhead & Hirsh, 2007, p. 74) and Coxhead's (2000) AWL covered 7.1% of the written university science corpus. Interestingly, the coverage pattern of the AWL and the EAP Science list over the science corpus began with Sublist One of the AWL as the highest at 2.87%, followed by the EAP Science List Sublist One at 2.01%. The next highest coverage figures were the AWL Sublist Two (1.49%), AWL Sublist Three (1.13%), and AWL Sublist Four (0.85%). From that point, the EAP Science sublists recorded higher coverage of the corpus (EAP

Science Sublist Two, 0.74%; Sublist Three, 0.45%, Sublist Four, 0.30%; and Sublist Five, 0.21%) (Coxhead & Hirsh, 2007, p. 74).

In a follow-up study, Coxhead, Stevens and Tinkle (2010) investigated the vocabulary load of a small corpus (280,000 running words), made up of a series of secondary school science textbooks. The researchers used the GSL, AWL and EAP Science List and found that the Science List covered 5.9 percent of the tokens (total running words) in the textbooks. This result is roughly 2% higher than the coverage of the same list over the university science corpus. The coverage figures from the two earlier studies (university science texts and secondary school science textbooks) made the researchers wonder what the results might be if the EAP Science List was used to analyse the vocabulary of medical textbooks at university level. In other words, would the coverage be similar to textbooks at secondary school level or similar to science-specific first year courses (and therefore the corpus which the word list was made from)? How useful is the EAP Science List to undergraduate medical students?

The EAP Science List and university-level medical texts
For the present study, two medical textbook corpora with around five million running words each were developed using whole textbooks. Two corpora were needed because in Quero's (2015) study, she was developing word lists for medical purposes and two corpora allow for validation measures (see Coxhead, 2000). MED 1 contains 5,431,740 running words, while MED 2 contains 5,890,477 running words. Both medical corpora provide a similar wide coverage of medical topics, such as abnormalities, addictions, body organs, care setting, chemicals, conditions, consultation, critical care, cures, diagnosis, disabilities, diseases, disorders, dysfunctions, healing process, health care, living organisms, measurements, medications, pain management, patients, recovery, remedies, surgeries, symptoms, syndromes, tests and procedures, treatments, and vitamins. The RANGE Programme (Heatley, Nation & Coxhead, 2002) was used for the analysis of the corpora.

Preliminary outcomes and discussion
Table 2 shows the coverage figures of the GSL, AWL and EAP Science List over the two medical textbooks, MED 1 and MED 2. The average total coverage of the word lists over the corpora is 75.86%. Note that the EAP Science List coverage over the medical textbooks is slightly higher (6.07%) over MED 1 and 7.65% over MED 2. The average coverage of the word list over the corpora is 7.94%. Out of a total of 318 word families of the EAP Science List 317 appear in both medical corpora. The only word family that did not occur in MED 1 is photosynthesis, and in MED 2 is tutorial. The GSL and AWL coverage figures are similar to those found in Coxhead's (2000) AWL study, where the AWL covered 9% of Coxhead's written academic corpus of 3.5 running words.

Table 2:
Coverage of the GSL, AWL and EAP Science List over MED 1 and MED 2 (%)

WORD LIST	MED 1	MED 2	Average
GSL 1,000	55.62	55.85	55.74
GSL 2,000	5.97	6.45	6.21
AWL	8.23	7.65	7.94
EAP Science	6.07	5.89	5.98
Total	75.89	75.84	75.86

Note that 24.12% of the MED 1 corpus and 24.16% of MED 2 are not found in any of the lists. The following 17 word families from the EAP Science list were the most frequent items in the list from both the medical textbooks:

Table 3:
The 17 most frequently shared items of the EAP Science List from the most frequent 20 word families in MED 1 and MED 2

acid	drug	serum
acute	fluid	tissue
cell	liver	urine
chronic	muscle	virus
deficiency	onset	
disorder	plasma	

Of the three scientific corpora to which the EAP Science List has been applied, the list has the highest coverage over the medical textbooks at 5.98% on average. This corpus was by far the largest, with over 10 million running words. The next highest coverage is the secondary science textbook coverage from Coxhead, Stevens and Tinkle (2010) at 5.9%. This was a small corpus with approximately 280,000 running words. The lowest coverage is in the original study by Coxhead and Hirsh (2007) at 3.79%, over a corpus of 1.6 million running words.

Reflection and next steps

Why might the coverage of the EAP Science List be higher over the medical textbooks corpora than over the two other corpora? It could be because of the size of the corpora. At over five million running words each, there is greater opportunity for the items in the word list to occur than in the far smaller corpora from the two other studies. It could also be that the medical nature of the corpora boosts the coverage figures of the EAP Science List. The researchers noted above the similarity in the top 20 most frequent families in the word list in both MED 1 and MED 2 (see Table 3 above). Or is it that the medical corpora contained textbooks? Perhaps textbooks have an effect on the coverage of word lists. These coverage figures suggest that the EAP Science List has some value for learners and teachers in identifying lexical items which would be worth investing some time in learning. Hirsh and Coxhead (2009) present suggestions for teaching and learning based on Nation's (2007) Four Strands using the EAP Science List.

It is important to note that the AWL/EAP Science Lists have been built based on West's GSL (1953) and any problems or principles from that first list carry through to the other lists. Two new GSLs (Brezina & Gablasova, 2015; Browne, 2013) and an academic vocabulary list (Gardner & Davies, 2014) have appeared in the literature recently, based on different corpora and, to some extent, different principles of selection. It would also be valuable to explore further the performance of these new general and academic word lists on specialised corpora from a variety of medical subfields and other scientific fields. This further research could lead to more EAP Science Lists being developed in future, depending on the outcomes of these studies.

This research clearly suggests that more work needs to be done on secondary school science texts to increase the size of the corpus for analysis. For example, a wider analysis of subjects in the Sciences such as the Health Sciences, Physics, Chemistry, and Biology could be undertaken. That research is underway. We also need to consider the effect of different fields of medicine for analysis. For example, will similar coverage figures be found, for example, in corpora on Biomedicine, Human Biology, Cell Biology, Psychology of Human Behaviour, Biostatistics and Biochemistry? And will textbooks contain similar levels of coverage to other types of academic reading in these fields? It is important to look at the words which did not appear in any list in this research. We need to find out more about the patterning of the word families from the EAP Science list in the texts, particularly in light of recent debates around lemmas versus word families as units of counting, and what opportunities are presented for teachers and learners to maximise their efforts to teach and acquire scientific vocabulary. We also need to consider when it might be best for this word list to be drawn on by teachers and learners.

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Appendix 1:
Headwords of the pilot science-specific word list (Coxhead & Hirsh, 2007, p.78)

absorb	apparatus	cavity	conserve
abundant	aquatic	cell	contaminate
acid	arc	chamber	contraction
acute	array	chloride	converge
adhere	atmosphere	chronic	convey
adverse	atom	circuit	cord
alcohol	axial	circulate	correlate
algae	bacteria	climate	cortex
align	barrier	cluster	counter
altitude	basal	coefficient	cube
aluminium	breakdown	coil	cumulative
amino	buffer	column	cylinder
ammonia	calcium	compact	dam
anatomy	calibrate	compartment	debris
ancestor	capsule	compress	decompose
anion	capture	condense	defect
anomaly	carbohydrate	cone	defense
apical	carbon	configure	deficiency

degrade	drain	feedback	gravity
dense	drill	fertile	grid
dependence	drug	fibre	hazard
deposit	electrode	filament	height
designate	electron	filter	hemisphere
diagnose	elevate	flora	homogeneous
diagram	elongate	fluid	horizontal
diameter	embed	flux	hormone
differential	embryo	fraction	humid
diffuse	emit	fracture	hybrid
digest	engage	fragment	hydrogen
digit	enlarge	fuel	impair
dilute	entitle	fungus	incubate
disc	enzyme	fuse	indent
discharge	equilibrium	generic	infant
disorder	evaporate	genus	infect
disperse	exert	gland	inferior
dissolve	exotic	gradient	infrared
distal	exponential	graph	inherit
diverge	extinct	grasp	inject

inlet	loop	nitrogen	perpendicular
insulate	magnesium	node	phosphate
insulin	magnet	nucleus	phosphorus
interface	magnitude	nutrient	photosynthesis
interior	marine	onset	physiological
intersect	median	optimum	pigment
intestine	membrane	orbit	plasma
invade	mesh	organic	plot
ion	metabolic	organism	plunge
junction	microbe	osmotic	polar
kidney	microscope	overview	pollen
laboratory	mobile	oxide	pore
lactate	module	oxygen	potassium
latent	moisture	parasite	precipitate
lateral	molecule	partition	profile
latitude	morphology	pathway	propagate
linear	mortal	peak	propel
lipid	muscle	penetrate	protein
liver	nerve	periphery	proton
longitudinal	nitrate	permeable	proximal

pulse	session	substrate	transient
purify	shaft	subtract	transverse
radial	sheath	superficial	tutorial
radiate	simultaneous	superior	uptake
radius	skeletal	susceptible	urea
recall	sketch	switch	urine
recreation	sodium	symmetry	vacuum
recycle	solar	symptom	vapour
replicate	soluble	synthesis	vector
resemble	solute	synthetic	vegetation
reservoir	span	temperate	vein
respiration	spatial	temporal	ventilate
rotate	species	terminology	verify
routine	specimen	terrestrial	versus
rupture	spine	texture	vertical
saline	starch	thermal	viable
saturate	static	tilt	vibrate
secrete	sterile	tissue	virus
segment	stimulate	toxic	viscous
serum	strain	tract	vital

vitamin

volt

wavelength

web

zinc

zone