AFFORDANCES OF IPADS FOR IMPROVEMENT OF
LEARNING OUTCOMES AND ENGAGEMENT IN AN ESL CLASSROOM

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ABSTRACT

This research paper attempts to answer the question of the affordances iPads have for the ESL classroom in terms of improving student engagement and learning outcomes. The research took place at a private primary school in Istanbul, Turkey over the course of four days in April, 2011. The participants were two groups of students in second and fifth grade with their respective teachers. The average total of students involved in the research was 30. A total of six iPad tablet computers were used in the study. The research methods used were observation and interviewing: observation of video recorded ESL classroom activity of students using iPads, and interviewing of students and teachers both before and after classroom observations. I have attempted to validate the major findings of the research through techniques of triangulation and saturation of qualitative and quantitative data. The major results are the following: (1) there are a number of significant affordances of the iPad which can cause student engagement leading to improved learning outcome, but (2) having 1 iPad per student tends to lead to increased student engagement and learning outcomes improvement overall, and (3) best practices in ESL teaching must be utilized for there to be cognitive engagement and improved learning outcomes in this particular context.
DECLARATION

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CHAPTER 1   INTRODUCTION AND CONTEXT

1.1 Aim and Rationale

“Technology is playing a greater role in foreign language education, generating greater student engagement and interaction and becoming more cost effective.”
(Niemuth 2010, p. 24)

In this research paper, the question I wish to address is: What are the affordances of a tablet computer such as the iPad for improving learning outcomes and student engagement in an ESL classroom? My research is primarily a case study (Nunan 1992, p. 75) as I will be investigating an instance of the use of a specific technology in several classrooms at a school over a short period of time.

Specifically, I will explore the use of technology in the form of iPads in a classroom of young ESL learners, in the implementation of individual and pair work activities. I wish to research the affordances of the iPad touch-based tablet in improving learning outcomes as well as student engagement for students in primary school, specifically in the second and fifth grades. I wish to evaluate the affordances of the iPad when used in combination with the following online content and software: (1) WordPress-based blogs with teacher-generated content, containing multimedia such as embedded Google Docs questionnaires and HotPotatoes quizzes and (2) iPad applications useful for ESL learners to achieve teacher-specified learning outcomes. I would also like to research the effectiveness of the iPad operating system (iOS, used for Apple mobile devices), its navigation system and multi-touch interface in terms of the affordances it offers to ESL students in particular.

In beginning my research project I needed to be informed of the literature on the following prevalent issues: (1) a firm understanding of current concepts of affordances of technologies and software applications (Gaver 1991; Norman 1999; McGrenere & Ho 2000), (2) awareness of current implementation of iPads in educational settings (Meurant 2010; Quillen 2011; Hu 2011; Shah 2011), (3) current research in mobile learning, or m-learning, would prove informative (Corbeil & Valdes-Corbeil 2007; Cheung & Hew 2009; Kukulska-Hulme 2007; Sharples et al. 2007; Liu et al. 2010) and finally (4) a theory of student involvement or engagement and its connection with student learning (Astin 1984; Axelson & Flick 2011). In order to conduct data collection and analysis, I also needed to be informed of

1.2 Research Context

My research context was an IB (International Baccalaureate) private school, named Enka Schools, located in Istanbul, Turkey. The primary school, consisting of grades one to five, has a student body of mostly Turkish nationals who are ESL students. I myself had been a first and second grade ESL teacher at Enka School for a period of six years from 2004-2010. As such, I was planning to do situated research into classroom interaction which gave myself as a researcher and the second language teachers involved “opportunities to theorize and improve practice” of using technology in the ESL classroom (Murray & Nhlapo 2001, p. 291).

As a researcher I also recognized I was both outsider and an insider: an outsider because I was no longer working in the role of a teacher at the school, but an insider in that I knew and was known by most of the participants involved in the research (Irvine et al. 2008, p.39). Coghlan (2007) states that “insider action researchers need to build on the closeness they have with the setting while, at the same time create distance from it in order to see things critically and enable change to happen” (p. 338). Therefore I had a certain advantage in understanding the setting I was in because of the length of time I had worked there, but I also needed remove myself from the environment slightly in order to make critical observations.

In order to conduct my research, I decided to visit the school for a period of 4 days from April 25th to 28th, 2011. I had chosen, in coordination with the school director and English department head, a week where there were no major whole school events or national holidays to disrupt the project, in order to have maximum amount of time in the classroom with the students. However, I was aware that “short term studies do not allow users the opportunity to fully adopt the innovation because students and teacher are still new to using such devices in education; hence they are still exploring them” (Cheung et al. 2009, p165). Nonetheless, one advantage to my context over this situation was that the iPad by its design was a highly intuitive and user-friendly device (see Chapter 2 for discussion on affordances). Special needs students were reported to be able to immediately pick up and start using it without any prior experience (Shah 2011). Because of my familiarity with the school demographics, I knew that most students at this particular school were at least familiar with using handheld mobile devices such as the iPhone, iPod Touch or iPad and either had them in their possession or had family members who owned such devices. Therefore these particular
students were coming into the research project with a certain degree of previous knowledge about the operation of the device.

Of the 5 grade levels in the Enka primary school, I decided to work with two grade levels of approximately 12-16 students each, as this was the only feasible option within the time I had. In coordination with the English department head, I agreed to work with the 2nd and 5th grade levels, as this was a good spread of different grade levels. The 5th grade would enable me to be more ambitious with students who had higher levels of technology skills. I was able to work with the teachers who showed the greatest interest in technology implementation in the classroom.

The context of technology implementation at the school was well developed. There were overhead digital projectors in every classroom, teachers had their own laptops and printers and students had access to computer labs. In addition, the fifth grade teachers had access to a classroom set of netbooks (small laptops with no CD drives). Tablet computers in the form of iPads had not yet been used by any department in the school so there was a novelty element with the introducing of these popular devices into a classroom, a factor I needed to take into consideration in my research.

A challenge in setting up my research was finding an organization in Turkey that could donate iPads to the project, as the school did not have any such devices. The Apple Inc. authorized distributors and premium reseller in Istanbul, Turkey, a company by the name of Bilkom, kindly agreed to donate 5 iPads to this project for the duration of the 4 days. I am grateful to the generous contribution of Bilkom for allowing me to use these iPads for the duration of the research project.
CHAPTER 2 LITERATURE REVIEW

2.1 Affordance Theory and the iPad

McGenere & Ho (2000) admit that the concept of affordance is popular but not well understood. The term was originally coined by Gibson (1979) who intended it to mean “an action possibility in the environment to an individual independent of the individual’s ability to perceive this possibility”, but Norman (1988) later defined an affordance as “the design aspect of an object which suggests how the object should be used” and emphasized “perceived properties that may or may not actually exist” (cited in McGenere & Ho 2000, p. 1). Gaver (1991) further developed the concept to include perceptible and hidden affordances, and noted:

“In general, when the apparent affordances of an artefact match its intended use, the artefact is easy to operate. When apparent affordances suggest different actions than those for which the object is designed, errors are common and signs are necessary.” (Gaver 1991, p. 80)

Applying these concepts to the iPad, we can postulate some general affordances that are inherent in its design. The iPad 1st generation (used in the project) is flat and rectangular in shape, has a 9.7 inch screen and is half an inch thick. By its very design it affords portability. It is able to be held like a book, or propped on a desk, or lies flat on the surface of a table. The apparent affordance of the screen is its touch sensitivity, as there are no other buttons obvious except the menu button and the side volume buttons. Its main affordance for interaction with the interface is the use of fingers. As Gaver states above, this makes the device easy to operate, because the affordance of using ones fingers to manipulate apparent objects on the screen is intuitive, i.e. we know how to use our fingers to manipulate things. The iPad then affords screen objects to be manipulated by the fingers in a tactile, self-explanatory manner – we swipe photos to push them off the screen, touch icons to activate them, pinch pictures to change their size, etc. As mentioned above, there can be hidden affordances on the iPad such as the double-click feature of the menu button that has a different functionality than the single click.

Gaver’s concepts of sequential and nested affordances are helpful in further understanding the affordances of the iPad: “sequential affordances explain how affordances can be revealed over time; nested affordances describe affordances that are grouped in space” (1991, p. 82). An example of a sequential affordance on the iPad is that the double-clicking of
the menu button opens a recent list of apps in a strip at the bottom of the screen. We can then swipe this list to choose from the most recent apps that have been opened. Another example of sequential affordances is that the iPad affords the ability for it to be held either in landscape or in portrait position. The operating system (iOS) has a built-in affordability of detecting this position change and causing the screen view to change to accommodate portrait or landscape viewing.

The iPad also has nested affordances. One example is that the touch-based interaction with any webpage involves nested affordances. The interface affords a user to swipe across the screen to scroll down the page. Grouped or nested with that affordance is the ability to pinch or stretch out your fingers on the screen in order to zoom in or zoom out of the page.

Lastly, Gaver notes that:

“Affordances are not passively perceived, but are explored…Exploration of afforded actions leads to discovery of the system. [Hence] learning is seen as a matter of attention rather than inference. The role of a good interface is to guide attention via well-designed groups of sequential and nested affordances.” (1991, p. 82)

The affordance of using your fingers to manipulate objects on the iPad screen is in itself practical and intuitive. Therefore the exploration of the afforded actions of the interface should also be practical and intuitive, as it involves using your fingers. It would follow that discoveries of how the iPad operating system or related application work should also be fairly intuitive, if designed to be used by your fingers.

As an example, a student should be able to explore the affordances of the buttons on the speech bubbles in an iPad application named Popplet by simply touching on them (see example in Appendix 3D). This should be fairly straightforward, as I will attempt to observe in the classroom. The interface should guide the attention of the student via sequential and nested affordances that are all accessible with the touch of a finger. This basic affordance of the iPad, touch-based manipulability, should allow students to quickly learn how to use the operating system and educational applications in order to spend the maximum time doing the ESL activity itself. One of the purposes of the classroom observations will be to see whether this statement is true or not.

2.2 iPads in Education

The first generation iPad was introduced in April, 2010, a year before my research was conducted. Apple Inc. sold 9.25 million iPads in the first quarter alone of 2011, selling more iPads to K-12 schools than they did laptops (Ogg 2011). Below is a sampling of some of the euphoric commentary in the education world since the iPad appeared on the market:
• “The iPad is generating more discussion about the role of technology in learning than any tool or event to date.” (Shareski 2011, p. 58)

• “Schools have begun adopting the Apple iPad in hopes the novel device will inspire student learning... the device could be the best thing to hit school technology “since the overhead projector.” (Davis 2011)

• “Educators are predicting the iPad will herald a revolution in the classroom, replacing textbooks with a mobile multimedia device to engage students in new innovative ways.” (Meurant 2010a, p. 227)

• “Though it’s too soon to collect significant quantitative data regarding the effect these devices have on English language learners, the experiences of the students and teachers using iPads … demonstrate the devices’ potential to enrich, enhance, and extend ELL instruction beyond the boundaries of the traditional classroom environment.” (Demski 2011, pp. 28-29)

Many of the articles and papers about the use of the iPad in education outline its affordances, summarized in a table in Figure 1.

<table>
<thead>
<tr>
<th>Affordance</th>
<th>Results noted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usability</td>
<td>• tactile experience unique (Shareski 2011, p. 58)</td>
</tr>
<tr>
<td></td>
<td>• causes ease of interaction (Ostachowski &amp; Reid 2010, p. 2862)</td>
</tr>
<tr>
<td></td>
<td>• intuitive (Meister et al. 2011, p. 30)</td>
</tr>
<tr>
<td></td>
<td>• touch-screen design easier than using mouse or touchpad (Shah 2011)</td>
</tr>
<tr>
<td></td>
<td>• easy for special needs students (Shah 2011)</td>
</tr>
<tr>
<td></td>
<td>• offers instant gratification (Shah 2011)</td>
</tr>
<tr>
<td></td>
<td>• less startup time (Quillen 2011b, p. 38)</td>
</tr>
<tr>
<td></td>
<td>• easier input than smartphones (Quillen 2011b, p. 38)</td>
</tr>
<tr>
<td>Visibility of screen</td>
<td>• increased screen size noted (Ostachowski &amp; Reid 2010, p. 2862)</td>
</tr>
<tr>
<td></td>
<td>• screen size facilitates more flexibility using the Web</td>
</tr>
<tr>
<td></td>
<td>• large touch screen (Hu 2011)</td>
</tr>
<tr>
<td>Audibility</td>
<td>• significant volume (Ostachowski &amp; Reid 2010, p. 2862)</td>
</tr>
<tr>
<td>Storage capability</td>
<td>• data collection (Ostachowski &amp; Reid 2010, p. 2862)</td>
</tr>
<tr>
<td>Portability</td>
<td>• portable by students in school (Meister et al. 2011, p. 30)</td>
</tr>
<tr>
<td></td>
<td>• and a weight of just over a pound (Quillen 2011b, p. 38)</td>
</tr>
<tr>
<td></td>
<td>• light weight offers a relief from heavy books (Hu 2011)</td>
</tr>
<tr>
<td>Usefulness</td>
<td>• useful as reference tool (Meister et al. 2011, p. 30)</td>
</tr>
<tr>
<td></td>
<td>• useful for a multitude of applications, including over 5400 with educational uses (Hu 2011)</td>
</tr>
<tr>
<td></td>
<td>• reading, listening, speaking, and writing is all done on one device. (Demski 2011, p. 32)</td>
</tr>
<tr>
<td></td>
<td>• educational applications such as interactive lessons, pronunciation dictionaries, voice recognition transcriptions, audio-enhanced illustrated books (White &amp; Gillard 2011, p. 4)</td>
</tr>
<tr>
<td>durability (of battery)</td>
<td>• battery life of 8 to 10 hours (Quillen 2011b, p. 38)</td>
</tr>
</tbody>
</table>

Figure 1: Affordances of iPad in the literature

However, educators and commentators also offer a word of caution. Quillen (2011b, p. 38) and Hu (2011) both mention that despite the fact that many schools are rushing in to adopt this new technology, educators are still trying to research best practices for the classroom. Davis (2011) notes that there is very little evidence to suggest that students learn more, learn faster or learn better by using iPads. He also notes the novelty factor of using a fun, easy to use new technology like the iPad, which can potentially wear off. Once this happens the teacher is left with the “hard-core issues of teaching and learning” (Davis 2011).
Quillen (2011a) observes that many of the educational applications available don’t allow teachers to monitor student progress or collect any kind of student data, because application developers gear their products more towards a parent-child dynamic rather than a teacher-student context. There is also no file structure on the device itself (Quillen 2011b, p.39) making it difficult to save and access student created content.

In one of the few overviews available on the iPad and ESL/EFL, Meurant (2010a) addresses the impact the iPad could have on SLA (2010a, p. 226). He gives a comprehensive list of the benefits of adopting iPads in the language classroom (2010a, p. 230), arguing that “the primary uses of English by non-native speakers will increasingly be computer-mediated” and offers, or rather tries to sell, the iPad as a solution to developing digital literacy in English (p. 232). However, Meurant does not detail any research findings of using iPads in EFL. He merely points out some useful insights gained from a 1:1 iPad implementation program at Cedars School of Excellence in Greenock, Scotland, detailed by Spiers (2011) in his blog at http://spiers.org (cited in Meurant 2010b, p. 60).

2.3 Mobile Learning

Despite the euphoria surrounding the iPad as an educational tool, it is important to remember that “we need insight into the particulars of how and why something works and for whom it works within the contexts of particular classrooms” (Cochran-Smith & Lytle 1993, p.15). My hope is that the research study outlined in this paper will shed some light on how and why the iPad can work effectively in the context of an ESL classroom.

A newly emerging field of mobile learning, or m-learning, can perhaps offer insight to my case study, because the iPad is inherently a mobile device. There are various interpretations of what m-learning is. Quinn (2000) defines it as “e-learning through mobile computational devices.” Others have a broader view of m-learning that is not confined to the technology itself, and incorporate the idea of mobility in physical space, mobility of technology, mobility in conceptual and social space, and learning dispersed in time (Sharples et al. 2007, p. 235). Han & Li (2010) state that “in m-learning contexts learners are trusted with great autonomy and that they are in charge of their own learning… The success of m-learning lies in an individual’s subjective willingness and cognitive engagement in m-learning activities” (p. 211). In reflection, my research study is very much about ESL students’ willingness and cognitive engagement with the m-learning activities that I had planned for the iPad.

Recent developments in m-learning are helpful to keep in mind when conducting my research. Phuangthong & Malisawan (2005) discuss perceived enjoyment, ease of use and
usefulness as factors contributing to positive impacts on the attitudes of users towards mobile technology. Wang et al. (2009) “find that performance expectancy, effort expectancy, social influence, perceived playfulness, and self-management of learning are significant determinants of behavioural intention to use m-learning” (cited in Han & Li 2010, p. 213). Han & Li also talk about the intrinsic value of m-learning being closely related to perceived entertainment, perceived enjoyment and perceived playfulness, noting that “when the process [of m-learning] is novel, interesting, enjoyable, exciting and optimally challenging, students will be intrinsically motivated to pursue learning activities” (Han & Li 2010, p. 219). In the observation of video recordings of classroom activity and during the interviews I will conduct with students, it will be interesting to see to what extent they perceive the iPad as a useful, playful and enjoyable device. I would need to observe whether students were more likely to be engaged with a device that had perceived playfulness and was easy to use because of its touch-based, intuitive interface, among other factors.

Cheung & Hew (2009) review current research methodologies in studies on mobile handheld devices in K-12 education settings and described a list of studies investigating whether the use of mobile handheld devices can improve or enhance learning outcomes, one of the subjects of my research (2009, p. 161). They concluded that “it seems the results of these studies overall suggest that using such handhelds can enhance student learning” (ibid. p. 162).

Nevertheless, m-learning researchers also note that “thus far m-learning has not yet had great impact on education context and the studies that address the adoption of mobile information and communications technologies in school settings are still lacking” (Han & Li 2010, p. 213). Therefore one of the motivating factors in doing research in mobile technology applications in primary school ESL programs is the need for research in this area.

Sharples et al. point out that “in the context of mobile learning evaluation, the effort should also be to see beyond the ‘wow’ factor associated with the technology, into how effective this is in engaging the learner over the long term” (2007, p. 242). The novelty issue of the iPad is important to take into consideration, also noted in Davis (2011). Students may be enamoured simply by the newness of the device, causing perhaps only superficial engagement. Whether this was the case or not in my context would be important to observe.

Corbeil & Valdes-Corbeil (2007) suggest questions to guide m-learning implementation, such as, “What course content is suitable for transmission to mobile computing devices?”, “What is the rationale for implementing mobile learning technologies?” and “How will the instructor’s role change?” (p. 54). Thus, these insights, suggestions and findings garnered from the mobile learning field should prove helpful in setting up my
research project as I plan to create ESL learning activities using the mobile technology of the iPad.

2.4 Student Engagement

Astin (1984) was one of the originators in the debate in higher education on the relationship between student engagement and student learning, still an evolving field of study, according to Axelson & Flick (2011, p. 42). They define student engagement as referring to “how involved or interested students appear to be in their learning and how connected they are to their classes, their institutions, and each other” (2011, p.38).

Gonyea & Kuh (2009) argue that the “engagement premise is straightforward and easily understood: the more students study a subject, the more they know about it” (cited in Axelson & Flick 2011, p. 40). If this is true, then it would imply that the more the students I observe are engaged with the ESL learning activities on the iPad, the more they will learn about those particular subjects. I will need to observe there that is indeed the case or not. However, Axelson & Flick suggest that I not just observe what they refer to as behavioural signs of engagement, i.e. students sitting at the table appearing to do work with the iPad. Rather, I must also observe signs of cognitive and emotional engagement. Evidence of cognitive or mental engagement in my context would be observing a student focused and completing the task at hand and evaluating their finished work. Emotional engagement would be evident in their feedback after the lesson during interviews.

The engagement question I must ask myself is “How can I engage (cognitively, behaviourally, and/or emotionally) ESL students most effectively learning activities on the iPad so that they will attain specific learning outcomes?” (Axelson & Flick 2011, p. 41). What will also be helpful is evaluating Astin’s (1984) theory of student involvement as it applies to the interpretation of my hypotheses concerning the analysis of my research data, which I will do in Chapter 4.
CHAPTER 3  PROCEDURES AND PROCESS

3.1 Research Methodology

3.1.1 Observation

I decided on observation as a main research method for this project. The reason I chose observation was “to establish objective data concerning what goes on… in a range of classrooms” (Wallace 1998, pp. 104-105). I chose to record my observations through digital video recording, so as to have what Cohen et al. describe as a “complete observer” typified as a “one-way mirror, the video cassette…” (2000, p. 305-306). The choice of using digital recording devices would allow me to later sort, categorize, edit and label the individual video shots I took in a very practical way.

Collecting observation data in the form of video recordings also would give me more time to do a thorough data analysis of the proceedings after the data collection period was over. Merely taking observation notes during the lessons wouldn’t have given me sufficient data. Video recording would also enable me to “make a permanent record of contextual and paralinguistic data, such as …layout of the classroom, movement, gestures, facial expressions, and so on” (Wallace 1998 p. 107).

Wallace also notes that the reality of video recording classroom activity is that “videotaping is selective: you can’t capture everything” (ibid., p. 107). Therefore it was important for me to be focused and selective in my video recordings. Hopkins states that “the more specific and negotiated the focus of the classroom observation, the more likely it is that the ‘data’ so gathered will be useful for developmental purposes” (2008, p. 76). I chose the focus of the observation to be the students, recording them both individually and in pairs, wanting to observe “the way they work, the way they interact, …their on-task and off-task behaviour” (Wallace 1998 p. 105). To an equal degree the focus was also on the context, defined by Wallace as, among other things, “the teaching aids available and how they are used” (ibid, p. 105). Since the topic of this research is the viability of the iPad as a teaching aid, the context then was student interaction with the iPad and how these devices were used.

Using Morrison’s list of observable features (1993, p. 80), cited in Cohen et al. (2000, p. 305), I and planned to observe the following features:

- The physical setting (i.e. the classroom in which I was recording my observations, where the students using iPads were located)
- The human setting (the students and teachers involved in the study)
The interactional setting (how students interact with each other and with the teacher)

The programme setting (how students interact with the resources in the classroom - in this case, how students engage cognitively and behaviourally with the iPads and accompanying software/applications)

The flexibility of using a video camera would allow me to record the different aspects of the research setting for future analysis, as well as to zoom in on subjects and make close-up observations of participants. I also wished to use in some instances two cameras positioned in different areas of the classroom to give me different perspectives of student activity. I would thereby hope to later study the video-recorded data of these incidents and make observations as to whether there were any anticipated or unanticipated affordances of iPads for the improvement of learning outcomes and student engagement.

I also planned to do unstructured observation during my time in the classroom by taking notes in my researcher journal. Cohen et al. note that unstructured observation operates “within the agenda of the participants, i.e. … [is] responsive to what it finds and therefore, by definition, is honest to the situation which it finds” (Cohen et al. 2000, p. 306). Wallace states that the advantage to this method of analysis, which he also calls ‘impressionistic’, is its flexibility (1998, p. 109), allowing there to be a discovery of affordances without any pre-determined systematic structure.

However, in the process of observing the video recordings, I also wanted to use what Cohen et al. describe as a semi-structured approach, having “an agenda of issues but …[gathering] data to illuminate these issues in a far less pre-determined or systematic manner” (2000, p. 305). Some questions I wanted to answer as I watched the videos were:

- What were the affordances arising from the use of the iPads by the students that seemed to cause students to be more engaged?
- What were the affordances arising from use of the iPads that seemed to improve students’ abilities to achieve learning outcomes?
- What were the unanticipated problems students had with the iPads?

I had set out to observe and hypothesize on a particular problem in order to find answers to a particular research question. In that way, my method of observation could also be described as what Wallace terms an *ad hoc* structured approach, where the categories being observed “derive from a particular problem or research topic” (1998, p. 113).

One of the purposes of this study was to measure to what extent students were engaged with the language activities in the lesson. If I was able to observe and measure on-task and off-task behaviour, I reasoned that this could correlate to a measurement of the level of engagement with the learning tasks students were meant to do on the iPads. I therefore decided to adopt a customized version of Hopkins’ observation chart of on-task and off-task behaviour (see Figures 2 and 3, based on Hopkins (2008), p. 93-94). Some instances I would group per pair of students using one iPad, as both were to be collaborating on the same task. I
decided to tally up instances of on-task and off-task behaviour per digital video file, and then tally up the totals at the bottom of the chart to compare total numbers of instances of on-task and off-task behaviour. I would thereby try to see patterns immersing from the observations.

<table>
<thead>
<tr>
<th>Data:</th>
<th>On-task behaviour (Tally Frequency)</th>
<th>Off-task behaviour (Tally Frequency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video Recording 1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Video Recording 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video Recording 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Figure 2: On-task and off-task student behaviour checklist sample*

**On-task behaviour:**
1. Stays on task to complete the app-based or website assignment (Tally per iPad)
2. Talks in L1 related to the assignment (Tally per student)
3. Talks in L2 related to the assignment (Tally per student)
4. Ask teacher/peer for guidance/assistance in completing task (Tally per student)
5. Shares device, works cooperatively (Tally per iPad)
6. Stays on app/websites related to topic being studied (Tally per iPad)

**Off-task behaviour:**
7. Does not stay on task to complete assignment (Tally per iPad)
8. Talks in L1 unrelated to assignment (Tally per student)
9. Talks in L2 unrelated to assignment (Tally per student)
10. Stalls when doesn't know what to do (Tally per student)
11. Does not share device, not cooperative with peers (Tally per student)
12. Does not stay on app/website related to topic (Tally per iPad)

*Figure 3: On-task and off-task student behaviour checklist key*

The focus of the observation, then, was on the trialling of a learning device, an educational tool for individual and paired learning, within the context of the particular classroom and school the research was being conducted in. As such I realized that I was not observing a genuine classroom per se, but rather a classroom “constituted for the purpose of collecting data” (Nunan 1992, p. 92). This was not an ideal situation in the strictest sense, but nevertheless one that was unavoidable considering this was new technology and new ways of doing ESL that I was introducing to the students.

Figure 4 shows a summary of my reasoning in choosing observation as a research method, based on Hopkins’ questions on clarity of purpose for observation (2008, p. 86):

<table>
<thead>
<tr>
<th>What is the purpose of the observations?</th>
<th>To study iPad affordances, student engagement and learning outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the focus of the observations?</td>
<td>How mainly individual and paired students use iPads in the classroom in 1:1 and 2:1 combinations</td>
</tr>
<tr>
<td>What student behaviours are important to observe?</td>
<td>On-task or off-task behaviour, Interaction with peers/teacher during the lesson</td>
</tr>
<tr>
<td>What data-gathering methods will best serve the purpose?</td>
<td>Unstructured observations for unanticipated affordances of iPads, Semi-structured or ad hoc observations, On-task and off-task behaviour observation charts</td>
</tr>
</tbody>
</table>
The group of students I would be conducting research with was what Wallace refers to as “a sample of a larger group” (1998, p. 127). What I have chosen is a purposive sampling (Cohen et al. 2000, p. 103) of approximately 30 students from grades 2 and 5 among the grades 1-5 primary school students totalling approximately 500 students (total number of students involved in research varied daily due to some absences). Wallace mentions that “a minimum sample size of 30 is usually thought to be desirable (1998, p. 132). Therefore I felt that I had a reasonably good number of students to work with to get significant results in my data analysis. Due to the fact that I only had time to interview about half of the students, the data collected from the interviews would admittedly be less reliable than the observations, but nonetheless would contain a wealth of information on student and teacher perceptions and opinions about how the lessons proceeded.

3.1.2 Interviewing

Because there were other observers in the classroom - namely the teacher and the students – I decided to conduct interviews with these participants after the lesson took place. Before the lessons occurred, I also wanted their initial thoughts on how they thought iPads could be useful in the ESL classrooms. I was therefore collecting qualitative data of student and teacher perceptions of what took place. Particularly, the method of interviewing would be introspective in nature, with the respondents “reporting on themselves, their views, their beliefs, their interactions, and so on” (Wallace 1998, p. 124). I did not have the opportunity to collect a large sample of responses to be statistically analyzed (ibid., p. 124), as I was not able to interview everyone involved due to time constraints. In this respect I knew that the data analysis results from the interviews would be significant but not as significant as that of the observations, which involved all the participants in the classrooms.

I was planning to do semi-structured interviews (Wallace, 1998, p. 147) and wanted to gather general perceptions and opinions about how successful the lessons with the iPads. For the students, I wanted to ask questions related to the perceived usefulness and playfulness of the devices (Liu & Han 2010, p. 216). Some sample questions I was going to ask students were:

- How much did you like learning English in this class? Why?
- What ideas did the iPad give you for better ways of learning?
- What did you think about the iPads? Why so?
Were they easy to use? How?
Do you think the iPads helped you learn English more? Why? Or How?

I was interested also in asking teachers their thoughts on the future of this type of technology in their classrooms, i.e. whether they thought the affordances of these devices merited long-term investment and implementation. Questions I wanted to hear teachers’ thoughts on were:

- How did you think the lesson with the iPads went? Explain.
  - Did it achieve your anticipated/planned learning outcomes?
  - To what extent did you find the students engaged?
- Do you see this project as being something you would want to implement long-term? Why or why not?

### 3.1.3 Researcher Journal

By keeping a researcher journal throughout the duration of the research project, I wished to be able to reflect continually on how the process of the research was coming about. I wished to use my journal for, based on suggestions from Wallace (1998, p. 63), was to provide myself with an ongoing record of unanticipated problems that needed to be addressed. I also looked forward to writing down those “Eureka!” moments where I would realize something about either student engagement, learning outcomes or the affordances of iPads that I had not thought of before. My plan was to keep the researcher journal on a Google Doc page that would instantly save itself online, that I could access from any computer, and that I could type on during the lesson as I observed and video recorded.

I also planned to keep a separate list of microdecisions (Freeman 1989, p. 37) – minute-by-minute small-scale decisions I made, either as mental notes or on-location actions or reactions to events that would take place. As well I would record the accompanying reflections on these decisions, i.e. why I made them or what the reasons were behind those decisions.

### 3.2 Procedures for Research Study

#### 3.2.1 Scheduling of Classroom Observations and Interviews

In terms of planning and preparing for the lessons students would attend using the iPads, I had a specific amount of classroom time to deal with. Of a weekly total of 9 English lesson periods per grade level, there were only 7 available in those 4 days. Each period was 40 minutes long. Due to the necessity of teachers reaching weekly curriculum-based goals to be assessed at the end of the term, and because this research was not part of that assessment, I
had available for my research only 3-4 of those 7 periods per grade level. Each grade level had two cohorts of English classes with 12-16 students in each. Whereas I was only able to work with one cohort from Grade 5, I was able to observe two cohorts of 2nd grade English classes, giving me more research time in the classroom with the students (see Figure 5). In total I was able to set up planned observations of 10 classroom periods totalling nearly 7 hours.

<table>
<thead>
<tr>
<th>Time</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td>Preparation time</td>
<td>Grade 2 A</td>
<td>Grade 2 A</td>
<td>Preparation time</td>
</tr>
<tr>
<td>8:30</td>
<td>Preparation time</td>
<td>Non-iPad classroom obs.</td>
<td>1st lesson with iPads</td>
<td>Preparation time</td>
</tr>
<tr>
<td>9:00</td>
<td>Students unavailable</td>
<td>Grade 2 A</td>
<td>Grade 5</td>
<td>Students unavailable</td>
</tr>
<tr>
<td>9:30</td>
<td>Students unavailable</td>
<td>2nd lesson with iPads</td>
<td>4th lesson with iPads</td>
<td>Students unavailable</td>
</tr>
<tr>
<td>10:00</td>
<td>Grade 5 Interviews with students</td>
<td>Preparation time</td>
<td>Grade 5</td>
<td>Grade 5</td>
</tr>
<tr>
<td>10:30</td>
<td>Grade 2 B Interviews with students</td>
<td>Students unavailable</td>
<td>2nd lesson with iPads</td>
<td>4th lesson with iPads</td>
</tr>
<tr>
<td>11:00</td>
<td>Grade 5 Interviews</td>
<td>Preparation time</td>
<td>Grade 5</td>
<td>Post-assessment interviews with Grade 5</td>
</tr>
<tr>
<td>11:30</td>
<td>with students</td>
<td>Students unavailable</td>
<td>2nd lesson with iPads</td>
<td>and 2 students</td>
</tr>
<tr>
<td>12:00</td>
<td>Students unavailable</td>
<td>Preparation time</td>
<td>4th lesson with iPads</td>
<td></td>
</tr>
<tr>
<td>12:30</td>
<td>Interview with teachers</td>
<td>Grade 2 B</td>
<td>Grade 5</td>
<td>Grade 2 A</td>
</tr>
<tr>
<td>13:00</td>
<td>2nd lesson with iPads</td>
<td>Preparation time</td>
<td>3rd lesson with iPads</td>
<td>3rd lesson with iPads</td>
</tr>
<tr>
<td>13:30</td>
<td></td>
<td>Students unavailable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:00</td>
<td>Grade 2 B</td>
<td>Grade 5</td>
<td>Grade 2 B</td>
<td></td>
</tr>
<tr>
<td>14:30</td>
<td>1st lesson with iPads</td>
<td>1st lesson with iPads</td>
<td>3rd lesson with iPads</td>
<td></td>
</tr>
<tr>
<td>15:00</td>
<td></td>
<td>3rd lesson with iPads</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15:30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 5: Schedule of class observations and interviews

3.2.2 Classroom Setup and use of iPads

I was able to plan lessons where a maximum of 6 students would use the iPads one-on-one in the classroom while the rest of the class continued with their normal work, as I was only able to procure the use of 6 iPads for this study. One positive aspect of the small number of iPads was that the research being done would be less invasive and would allow the teacher to continue undisrupted with her regular schedule. I would be able to observe the dynamic of half the class using iPads individually while the other half did an activity with the teacher. The class would then rotate and switch activities, so that all students got one-on-one time with the iPad.

Another classroom setup the small amount of devices would allow would be collaboration between pairs of students working on one iPad. Some advocates of iPad use in the classroom believe “the iPad is designed to be owned and not shared” (Friers, 2011). However, I wanted to experiment with students doing collaborative pair work on the iPad. I wanted to observe the results of this 2:1 collaboration in terms of whether more L2 was produced during this time and whether students were more or less engaged in the activity as compared to individual 1:1 work (see research aims for Grade 5 lesson plan in Appendix 2D).
3.2.3 Ethical considerations

This research project involved minors under the age of 16 as well as video footage of these students in the classroom. Therefore, in line with ethical research practices at the University of Manchester and the policies of Enka School, I asked for parental consent in writing from the students who were to participate in the research project (see Appendix 1). Student pictures shown in this research paper are therefore intentionally defaced.

3.2.3 Lesson planning procedures

In terms of planning a series of lessons in which the iPads would be used, I needed to first make contact through emailing and Skype video calls with the second and fifth grade English teachers. I was thereby able to determine the specific learning context my research was to take place in. For the second grade students, the unit of study was on reducing, reusing and recycling. The students were also doing a parallel reading unit with level-appropriate readers. Therefore I would need to prepare topic and reading unit related content on the iPads for the students to do in class (see Appendices 3A-3G). The idea was for the iPad activities to supplement what was already being done in the lesson with the teacher. I would thereby be able to determine whether or not iPads could be effective in supplementing and enhancing the course content. This I reasoned could in turn potentially have an influence in improving learning outcomes (see Appendices 2A-2D for iPad lesson plans).

The fifth grade students were studying a unit on production. They were scheduled to do research on the production of chocolate. I planned to have the iPad used by students as a research tool to explore and present their findings on how to make chocolate. I also planned other production unit related iPad activities, in coordination with the teacher (See Appendix 2C). As the fifth grade students were also doing a reading unit, I prepared reading comprehension questions to be answered on the iPad on an interactive online questionnaire done on Google Docs (See Appendices 3F-3G) for both the lower and higher reading groups.

The lessons planned for the duration of the four days were therefore divided into either unit or reading related activities. This enabled me to explore different affordances of the iPad in these settings in relation to the lesson focus (see Figure 6). The preparation of activities involving these iPad features will be explained in the next section.
<table>
<thead>
<tr>
<th>Day</th>
<th>Grade 2</th>
<th>Grade 2 B</th>
<th>Grade 2 A &amp; B</th>
<th>Grade 2 A &amp; B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>1st lesson</td>
<td>2nd lesson</td>
<td>1st lesson</td>
<td>final lessons</td>
</tr>
<tr>
<td>Lesson focus</td>
<td>Recycling Unit</td>
<td>Recycling Unit</td>
<td>Recycling Unit</td>
<td>Reading Unit</td>
</tr>
<tr>
<td>iPad features:</td>
<td>• Notepad</td>
<td>• WordPress Enkablogs website</td>
<td>• WordPress Enkablogs website</td>
<td>• Popplet app</td>
</tr>
<tr>
<td></td>
<td>• On-screen keyboard</td>
<td>• YouTube</td>
<td>• YouTube</td>
<td>• Safari Internet browser for image search</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• HotPotatoes embedded quizzes</td>
<td>• HotPotatoes embedded quizzes</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Blackboard app</td>
<td>• Blackboard app</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Google Docs forms</td>
<td>• Google Docs forms</td>
<td></td>
</tr>
<tr>
<td>Grade 5</td>
<td>Grade 5</td>
<td>Grade 5</td>
<td>Grade 5</td>
<td></td>
</tr>
<tr>
<td>Lesson focus</td>
<td>Reading Unit</td>
<td>Production Unit</td>
<td>Reading Unit</td>
<td></td>
</tr>
<tr>
<td>iPad features:</td>
<td>• WordPress Enkablogs website</td>
<td>• WordPress Enkablogs website</td>
<td>• Popplet app</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Embedded Google Docs form</td>
<td>• Unit related websites</td>
<td>• Safari Internet browser for image search</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sentence Builder app</td>
<td>• Safari internet browser for image search</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• YouTube for iPad</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Keynote app</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Notepad</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 6: Lesson focus & iPad features to be used

3.3 Explanation of iPad Activities

3.3.1 WordPress blogs

The idea of using WordPress came from my previous experience working with this online content management system. It was an easy-to-use, easily updatable platform that teachers could easily edit and update to according to their teaching needs. WordPress blogs had been introduced to the school and teachers had been trained in using them. I used Enka Schools’ own WordPress series of blogs located at www.enkablogs.com for the purpose of this project. I then set up a series of blog entries of activities students could be navigated to from their iPads by pressing on icons in the iPad menu panel (or home screen, see Appendices 3H). Students would be navigated to videos and websites related to the units they were studying (Appendices 3A, 3E). Google Doc Forms were used to create online questionnaires related to the topic or reading unit, allowing the teacher to see the results of the questionnaires in an online spreadsheet (Appendices 3C, 3G, 3H). I also created customized HotPotatoes quizzes that gave students instant feedback on their answers (Appendix 3B).
3.3.2 Educational apps

The choice of which iPad applications (or ‘apps’) to use was directly related to the lessons planned for the research project in coordination with the grade level teacher. The second grade teacher requested students brainstorm ideas about various uses of recyclable products. Therefore I decided to have students type their ideas on the iPad’s pre-installed Notepad app. The fifth grade teacher for the Day 3 lesson plan wanted students to prepare a presentation of their research findings on an app similar to PowerPoint, so I downloaded the KeyNote app, Apple’s version of PowerPoint, and synchronized this app to all the devices. A similar procedure was done for the Blackboard, Sentence Builder and Popplet apps. Meurant argues that the relatively low cost of purchasing apps for education can in most cases be taken on by a school having already purchased a number of iPads, as Apple allows for syncing of the downloaded app with multiple devices (Meurant, 2010a). All iPads had identical configurations of apps in their menu panes in order for the devices to be interchanged among students and the different grade levels.
CHAPTER 4  DATA ANALYSIS AND RESULTS

4.1 Framework for Analysis

Drawing on Hopkins’ (2008) discussion on fieldwork methodology, I will be using the following framework in my procedures for classroom research analysis (Hopkins 2008, p. 137):

1. Data collection and the generation of hypotheses
2. Validation of hypotheses using techniques for trustworthiness (triangulation, saturation, etc.)
3. Interpretation by reference to theory, agreed criteria, established practice or teacher judgment
4. Action for future implementation (discussed in Chapter 5)

Hopkins states that these stages represent “standard practice for the analysis of qualitative field data” and though this framework is commonly used by sociologists and anthropologists to make sense of social situations, “this same process can be used by teachers to analyse data emerging from their own classroom research efforts” (2008, p. 131).

What I wish to do in the following pages is to give a summary of my data collection efforts using the research methodology described in Chapter 3, which occurred over the course of the 4-day research project. I will proceed to generate hypotheses that came about as the result of analyzing and reflecting on the data collected. I will then offer a validation of these hypotheses based on selected techniques for establishing the validity of hypotheses, namely triangulation of participants’ perceptions and sources of data, as well as the technique of saturation. The next stage will be interpretation, where I will take validated hypotheses and fit them “into a frame of reference that gives [them] meaning” (Hopkins 2008, p. 136), relating the hypotheses to theory, established practice and teacher judgment. At this stage I will attempt to frame my hypotheses in light of the theory of student involvement and its relation to student learning postulated by Astin (1984). The conclusions drawn from these interpretations will lead to a summary of the research results and recommendations for further action in Chapter 5.

4.2 Data Collection

4.2.1 Overall results of data collection

At the end of my 4-day research project, I had collected approximately 7 hours of video, more than 7000 words of transcribed interviews (excerpts in Appendix 4), and more than 20 pages
of research journal and observation notes from the video recordings (Appendices 5, 7 and 8). In addition I also collected samples of student work (Appendix 6) that they completed on the iPads. This was my total data set or data corpus. For a table of these results see Figure 7.

<table>
<thead>
<tr>
<th>Research Method</th>
<th>Participants</th>
<th>Grade level</th>
<th>Video recordings</th>
<th>Length:</th>
<th>Data analysis:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviewing</td>
<td>Teacher</td>
<td>2</td>
<td>Interviews before and after iPad lessons</td>
<td>00:16:10</td>
<td>Transcription of interviews (Appendix 4C, 4E)</td>
</tr>
<tr>
<td>Interviewing</td>
<td>Students</td>
<td>2</td>
<td>Interviews before iPad lessons</td>
<td>00:26:06</td>
<td>Tabulated results of responses to questions (Appendix 4B)</td>
</tr>
<tr>
<td>Observation</td>
<td>Students</td>
<td>2</td>
<td>Students using iPads during lesson</td>
<td>02:05:37</td>
<td>Observation notes (Appendix 5C, E, G, K, L) and on-task behaviour chart (Appendix 5A) and student work on iPads (Appendix 6)</td>
</tr>
<tr>
<td>Observation</td>
<td>Students</td>
<td>2</td>
<td>Lesson with no iPads in class</td>
<td>00:17:37</td>
<td>Observation notes (Appendix 5D)</td>
</tr>
<tr>
<td>Interviewing</td>
<td>Teacher</td>
<td>5</td>
<td>Interview after iPad lessons</td>
<td>00:06:09</td>
<td>Transcription of interviews (Appendix 4D)</td>
</tr>
<tr>
<td>Interviewing</td>
<td>Students</td>
<td>5</td>
<td>Interviews before and after iPad lessons</td>
<td>00:41:38</td>
<td>Transcription of interviews (Appendix 4A, F)</td>
</tr>
<tr>
<td>Observation</td>
<td>Students</td>
<td>5</td>
<td>Students using iPads during lesson</td>
<td>03:12:54</td>
<td>Observation notes (Appendix 5F, H, J, I) and on-task behaviour chart (Appendix 5B) and student work on iPads (Appendix 6)</td>
</tr>
<tr>
<td>Introspective</td>
<td>Researcher</td>
<td>NA</td>
<td></td>
<td>NA</td>
<td>Excerpts from Researcher Journal (Appendix 7) and Excerpts from Microdecisions list (Appendix 8)</td>
</tr>
</tbody>
</table>

**Figure 7: Total data set (data corpus) for research project**

### 4.2.2 Procedure for data collection

I took researcher journal notes before, during and after the lessons (see Appendix 7), kept a list of micro-decisions I made in relation to the planning and implementation of the iPad lessons (Appendix 8), and recorded video onto digital memory of the 10 classroom periods I attended. I also conducted interviews with students and teachers before and after the lessons and recorded these on video.

I later went back to view the video files and transcribed most of the interviews that were most useful to the study (see Appendix 4), mainly the interviews with the Grade 5 students and teachers from both Grades 2 and 5. For the students from Grade 2 that I had briefly interviewed before classes, I summarized the results in a chart, (see Appendix 4B).

Much of the interview time was unstructured in that one question led to another in a naturalistic way, but for the pre-lesson interviews my basic goal was to garner initial thoughts on the use of iPads in the classroom, and for the post-lesson interviews, to get feedback on how the lessons went and what the students’ and teachers’ thoughts were in regards to the effectiveness of using iPads in the classroom. Some questions and topics I later realised were irrelevant to answering the research question, so I have therefore excluded them from the interview transcriptions. In reflection, especially with the teacher interviews, I had implicit rather than explicit research intentions in coming into the interviews, which resulted in both
relevant and irrelevant data being produced. This was most likely a result of the insider nature of my role as a researcher. Because I had worked with these teachers for many years, I chose to adopt a less formal and more conversational approach to the interviews as this I felt was more socially appropriate based on our previous collegial relationships.

With the 51 video files I recorded, I sorted and labelled these, then viewed them, collecting the following data: On- and Off-task behaviour (see chart in Appendices 5A-5B), observation notes (Appendices 5C-5L) in which I reflected on the following:

- What were the affordances of iPads for student engagement, noting behavioural, cognitive and emotional engagement (Axelson & Flick 2011, p. 41).
- What if any were the learning outcomes students achieved through using the iPads?
- What were the unanticipated problems and reasons for these?
- Were there any actions for future implementation? (i.e. if I did this over again, what would I do better)

Data collection was facilitated and increased by at times having two cameras in the classroom running simultaneously, with different angled shots in order to capture whole class activity as well as individual or pair work close-ups of students using iPads (see Figure 8). This allowed me to see better what students were actually doing on the iPad screen, as currently no screen capture application is commercially available.

![Figure 8: Video recording methods](image)

### 4.2.3 Reliability of data collection

Hopkins states that “reliability [of data collection] is concerned with consistency and generalizability and the use of standardized instruments” (2008, p. 141). He cites McCormick and James (1989, p. 188) in noting that “reliability is concerned with consistency in the production of results” where under similar circumstances and instruments, comparable evidence and results would be achieved.

In terms of consistency in data collection I would have benefitted from having more time allocated to the interviewing of every single student involved. For instance, Grade 2
students were not available for interviews at all on the last day of iPad lessons, so only post-
lesson feedback from Grade 5 students was possible. Having said that, in the end I did feel
that I had sufficiently enough interview and observation data to adequately answer my
research question, as will be explained further in this chapter.

In the observation charts I made (see Appendices 5A and 5B), I noted instances of on-
and off-task behaviour per video file, and tallied the frequency of these instances per student
or per iPad. My goal was to get a very basic sense of instances of on- or off-task behaviour. I
feel that the amount of video recorded data collected and the manner in which it was collected
was sufficient to generalize on the level of engagement the students had.

4.3 Generation of Hypotheses

Having collected the above mentioned data, I have come to what Hopkins describes as “a sub-
stage [that] follows immediately or co-exists with the collection of data – the generation of
hypotheses”, that is an attempt at interpreting and explaining, among other things, why certain
events in the classroom are happening and the causes for those events (2008, p. 132).

In the course of observing and attempting to interpret the video footage of students
using iPads in the classroom, I began to form hypotheses about the usefulness of iPads and
their affordances in improving student engagement and learning outcomes. Hopkins
recommends that at this stage of generating hypotheses, “the richer and more creative our
thoughts, the more likely it is that the research will result in a coherent and complete

Looking over my observation notes for the video recordings (my largest data set), I
noted the following major propositions or hypotheses related to answering my research
question. Firstly, from looking at the On-task / Off-task observation chart (see Appendices 5A
and 5B), a very basic general observation is that the instances of on-task behaviour in both
grade levels consistently and significantly outnumber that of off-task behaviour. In fact some
instances of off-task behaviour (using L2 unrelated to task, not working cooperatively with
partner), were at 0 for all observed video footage. Other instances of off-task behaviour were
only noted 3-4 times over a period of 2-3 hours of video footage. My hypothesis, just looking
at this data, is that the presence of the iPad and its inherent affordances led to sustained
student engagement with the learning material presented on these devices, which thereby
enabled students to achieve learning outcomes.

Secondly, a significant hypothesis that came from mining the observation notes for the
recorded iPad lessons was that in most cases where there was a pair of students using 1 iPad
(2:1), the student actually operating the device was more cognitively engaged and thereby
profited more from the learning activities he or she was engaged in. This led me to conclude that the student that was operating the iPad improved their learning outcomes more than the student not operating the iPad. So another way to state this hypothesis is that those students working with iPads 1:1 seemed to be more likely to be engaged with the task and therefore achieve learning outcomes than those who were in a 2:1 or even 3:1 ratio of students to iPads.

A third hypothesis that came out of the observation notes was that, in order to maximize the full potential of the iPad and all its affordances as an ESL learning device causing cognitive engagement and improved learning outcomes, best practices in ESL teaching need to be applied. This can include careful planning, selection of language appropriate apps and websites, pacing of lesson, assigning level-appropriate tasks, giving specific step-by-step instructions, etc. (noted in Appendix 5L).

A list of the above mentioned hypotheses is shown in Figure 9:

<table>
<thead>
<tr>
<th></th>
<th>Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Affordances of the iPad can cause student engagement leading to improved learning outcomes.</td>
</tr>
<tr>
<td>2</td>
<td>Having 1 iPad per student (1:1) tends to lead to increased student engagement and learning outcomes improvement.</td>
</tr>
<tr>
<td>3</td>
<td>Best practices in ESL teaching must be utilized for there to be cognitive engagement and improved learning outcomes with students using iPads</td>
</tr>
</tbody>
</table>

Figure 9: Hypotheses for iPad usage in the classroom

4.4 Validation of Hypotheses

4.4.1 Validation techniques

In attempting to establish the validity of my hypotheses, I will begin with triangulation. Cohen et al. state that “triangulation (of methods, of observers, of time and space) can assist the researcher to generate reliable evidence” (2000, p. 310) Hopkins warns of the risk of observations being selective, but that “the effects of this can be attenuated by triangulation” which he defines as the process of “contrasting the perceptions of one actor in a specific situation against those of other actors in the same situation” (2008, p. 133). Therefore, if I were to contrast my own subjective perception of the classroom incidents I observed with those of the teacher and students who were also there with me, my own observations and perceptions would be given a greater degree of authenticity and hence validity. This approach is also substantiated by Elliot and Adelman’s definition of triangulation as involving the “gathering accounts of a teaching situation from three quite different points of view, namely, those of the teacher, his pupils, and a participant observer” (1976, p. 74), cited by Hopkins (2008, p. 133).

In collecting the video recording observation notes and charts, my researcher journal notes, interview transcriptions from students and teachers, and combining them together in the
process of triangulation, I had a wealth of data to draw on in determining what the affordances of the iPads were for learning outcomes and student engagement. By further combining the triangulation of the perceptions of the different participants with the triangulation of sources of data, this would then serve to complement and enrich the validation of my initial hypotheses. Additional sources of data I collected include a list of micro decisions and related reflections (Appendix 8) as well as student work (Appendix 6) including iPad screen snapshots and Google Docs spreadsheet answers.

Another validation technique I will be using on my data is saturation, which Hopkins describes as a process by which “the hypothesis or category generated from observation is tested repeatedly against the data in an attempt to modify or falsify it” with an outcome that the concept is either discarded if found wanting or modified, refined and amplified (2008, p. 134). I will then repeatedly skim through my corpus of data for loopholes or inconsistencies of my hypotheses in comparison with the data. Once repeated observation leads to neither a refutation nor a refinement my hypotheses, but instead to support of the hypotheses, I can say that saturation has occurred and my hypotheses have been validated.

A comforting thought that Hopkins delineates is that, when “employing analytical techniques such as triangulation…teacher-researchers can produce hypotheses and concepts that are methodologically sound and to an extent generalizable” (2008, p. 136). Once my hypotheses are validated I can make conditional generalizations about my research topic findings. In the process I would be producing “what Glaser and Strauss have called grounded theory, because it is theory grounded in data gathered from and applicable to a specific social situation” (Hopkins 2008, p. 136, citing Glaser & Strauss 1967).

4.4.2 Validating Hypothesis 1

Using the above described validation techniques, I will begin with the first hypotheses:

**Hypothesis 1:** The affordances of the iPad can cause student engagement leading to improved learning outcomes.

As noted above, this hypothesis primarily came about observing instances of on-task and off-task behaviour (see Appendices 5A and 5B) and finding significantly more on-task than off-task behaviour. One question I need to ask is “What were those affordances of the iPad that caused student engagement leading to improved learning outcomes?” Triangulating with the data gained from interviewing the participants involved, I will begin with student perceptions during interviews before and after the iPad lessons. Firstly, all students I interviews (a total of 16 students) said they liked the iPad for a number of different reasons. These are some of the affordances they saw in the iPad tablet device:
Students, then, perceived inherent affordances of the iPad that made them like using the device for learning English. The video recordings proved that they were for the majority of the time behaviourally engaged, i.e. sitting at the tables doing the designated activities at the iPads for the duration of the video footage (see on-task behaviour in Appendices 5A, 5B). That they were able to complete the tasks, also noted in the observation charts, showed that they were cognitively engaged as well.

Let us then add to the triangulation the teachers’ own perceptions of whether the iPad affordances led to student engagement and achievement of learning outcomes. The 5th Grade teacher stated that “What I observed was students were totally engaged in what they were doing and they loved using it [the iPads]” (quote from interview transcription in Appendix 4D). She also noted:

“I loved seeing them so engaged and they did what they were supposed to do. All the tasks were complete except for I think the research part because of the amount of the task was more than the others so they couldn’t complete it. But other than that those four days for that class was very productive and...fun!”

“… when I compare it to the handouts that we generally use… like comprehension questions … They’re [the students] not great [fans] of those types of activities but what I saw was they were willing to… you know… type in something so... even my low students were trying to type some answers [to complete the reading comprehension activity] (Quoted from Appendix 4D)

This teacher, then, was clearly aware that her students were cognitively, behaviourally and emotionally engaged with the tasks given. According to her, they completed the language learning tasks on the iPads satisfactorily, thereby achieving the learning outcomes of that lesson. The teacher saw the affordances of the iPad as its multi-purpose ability to be used as a notepad, a PowerPoint maker and presenter, a research tool, and a book reader, as well as a questionnaire to be used (more effectively for lower students, she noted) in place of paper and pencil quizzes.

The Grade 2 English teacher (see Appendix 4E) agreed that the students were excited about using the iPads and had fun with them, but also noted some hindrances to learning the iPads caused. She thought that the typing on the iPad was difficult and not so much better
than using paper and pencil. She felt that a major disadvantage was a lack of a stylus to write with on the iPad, as early primary students are learning how to write at that stage and should be using their fingers to write. There was also an inability, when writing, to put your palm on the device without disrupting the touch sensitivity of the device. However she also noted some affordances of the iPad that seemed to be beneficial in the classroom. One was the ability of a student to re-watch videos on their own if they needed to hear something again or understand it better. She also noted that a major affordance would be having the iPad used for students to read levelled readers, enabling a very efficient and easy distribution of level-appropriate reading material.

Other sources of data such as student work shown in Appendix 6 were proof that student did in fact complete learning tasks that were planned. Students in the Grade 5 classroom on Day 2 completed all their reading comprehension quiz answers which they submitted to a Google Docs spreadsheet, and which the teacher was able to view later (see Appendices 6A:1 and 6A:2a, 2b, noting observations column). This set-up, using Google Docs Forms on iPads for questionnaires, allowed the additional affordance of the teacher later showing the students their answers to the whole class on the digital overhead projector, further allowing learning to occur with whole-class error correction and discussion.

My Research Journal notes taking during the lessons (see Appendix 7) indicated that students were engaged “more than usual” and that the teacher noticed that “even the worst behaved kid was engaged throughout the whole lesson” (App. 7B). This was the same student she referred to in her initial interview as being normally 95% off-task and unengaged (App. 4C). I also noted that the affordance of the iPad to make presentations on the Keynote app sufficiently engaged the students, who enjoyed using the iPads to do this and were able to complete their tasks and send their finished presentations as PowerPoints to their teacher for future viewing and discussion, thus achieving learning aims and desired outcomes (App. 7C, 7D).

Lastly, my list of micro-decisions in Appendix 8 showed that there were certain limitations of the iPad that were potential impediments to learning and that would compromise the validity of my hypothesis to a certain extent. One limitation I noted was the inability for the iPad to open Adobe Flash based websites, including Flash based YouTube videos. This in turn would limit a teacher’s ability to choose topic-related content for students to work on. Certain java applets also were unable to function on the iPad, such as the drawing program at www.dreezle.com. The counter-argument for these disadvantages was that the students still showed sufficient engagement with the content that was available on the iPad, and students still managed to attain learning outcomes, as discussed previously (see also
comment in Appendix 5H). However, the educational benefits from future versions of the iPad being able to show Flash and Java applet based websites would, in my assessment, be substantial in availing teachers of more online content for students to access.

Moving from triangulation to saturation, I reflected that all of the above discussion on validating the first hypothesis must be substantiated with evidence from my observation notes of the 7 hours of video recording that I took of the lessons. I therefore proceeded to look for evidence to falsify or substantiate and further modify or refine my initial claim.

I noted in my observation of a Grade 2 class that wasn’t using iPads that the paper activity they were doing seemed to be just as cognitively engaging as the iPad activities. Students were able to simultaneously add to the drawing to complete the task, something not really practical on an iPad. But if one were to compare paper to tablet computing devices, and if we were to replace the word ‘iPad’ in my hypothesis with ‘paper’, the hypothesis would not necessarily be true. The paper in itself didn’t ‘cause students to engage in the activity’ but rather facilitated the students’ engagement with the activity or task at hand. The iPad, however, seemed to attract students from the beginning, unlike paper, in that they were seen to be motivated and excited to use the devices, perhaps curious about the hidden affordances of the device (Gaver 1991, p. 80).

I noted other hindrances to iPads being effective in achieving learning outcomes:

- Student Y appeared frustrated over keyboard operation (App. 5C)
- Keyboard navigation problems [were observed] (App. 5C)
- iPad speakers were too low for students to hear well when class noise level was high (App. 5E)
- Long load time [of topic related website] caused students to be inactive (App. 5E)
- HotPotatoes activities initially had bugs (some JavaScript incompatibility) that needed to be fixed (App. 5E)
- Topic related “BrainPop” website didn’t work because of Flash (App. 5H)
- Some of the buttons and features on Popplet were very hard to click on and access (App. 5J, App 3D)

Teachers would need to be aware of these hindrances when planning lessons with iPads in order to avoid compromising their learning goals.

In terms of affordances, I observed in Appendix 5E that an effective combination was for the students to use the iPads to access Enka Schools’ official WordPress-based blog site, called Enkablogs (see Appendices 3A, 3B, 3E). They would then access their grade level blog, and use this as a launch pad for the activities they were to do in class. The iPad operating system afforded a simple icon being placed on its main menu for students to connect easily with the blog and its various activities. I noted that the integration of embedded videos, HotPotatoes activities and Google Docs questionnaires worked effectively (once bugs were fixed) and led to sustained engagement on the part of the students, with all related activities being completed by the end of class.
Additionally, I observed that the iPad afforded a navigation system of icons that let teachers and students easily control and access the extra activities in the form of related apps and website icons on the customizable menu panels (see Appendix 3H). All the iPads had been synced previous to classes starting with menu panels of icons with appropriate extra activities situated next to the main activity icons. This touch-based navigation structure was set up to eliminate distractions from unrelated apps and games that could be present on the iPad (a concern raised by the teacher in Appendix 4D). With an easy-to-navigate panel of related apps, students were able to quickly access early finisher activities after they had completed their main task, and transitioned smoothly to related tasks selected in the menu panels. This enabled students to stay on task, not disturbing other students. The extra early finisher activities allowed them to reinforce their learning of targeted language and hence improve learning outcomes (see observation notes in Appendix 5E).

Affordances were observed with the use of the Keynote app and the Popplet app, in Appendices 5J-L. The affordance of double-clicking the iPad menu button to quickly access recently used apps allowed students in Grade 5 to switch between two applications. This allowed them, for example, to take notes on the Notepad and then switch immediately back to a pdf file describing how chocolate was made (see Appendix 5I). Similarly, another student was able to go from the Keynote app to the internet on Safari, search for an image, copy it, and immediately jump back to the Keynote presentation to paste it in where she wanted it, all in a matter of seconds.

Another unexpected affordance of the iPad was observed in the first lesson of Grade 2 students on Day 1:

- Students used [an] extra iPad (researcher’s) to locate the Turkish translation of the word "wheel" [on Google Translate or similar site], then typed it on the iPad to finish the task. One iPad can be used to help another. Or two iPads can be used by one student or pairs of students, in different roles to complete one task. (Appendix 5C, Figure 10)
The affordance of the second iPad was a supplemental device for a main activity, in this case a dictionary / translator. A further reflection came in conversation with class teacher, where I noted in my Researcher Journal:

“.. we discovered a salient use of the iPad …. The teacher said, ‘If there were an iPad at each table, then it could be set to a Google Translate app that the kids would use to type in a Turkish word and get a translation to help them with the work they were doing.’ This, she reflected, could lead not only to increased learning on the part of the student, but less time having to track down the teacher, get out of their seat to get the teacher, and the teacher is freed up to help others. Basically the idea is having the internet inconspicuously available at each table, to help with paperwork. [The teacher reflected] ‘If the iPads were introduced at the beginning of the year and became inconspicuous and a normal part of the classroom, it would be less of a novelty and perhaps more effective in its usefulness in bringing information to the students in an easy and accessible way’” (from Appendix 7B).

An affordance of the iPad we noted was its flatness or compactness, in that it almost blends in with the classroom table, making it inconspicuous – almost as if it were part of the furniture. Yet it was the world of educational apps and the internet right at your fingertips (see also notes in Appendix 5D).

One final issue I observed was that, whereas some students knew about affordances such as the ability to quickly translate words on Google Translate, double-click the menu button to access recent apps, use multi-touch gestures, etc., many students did not (see interviews in Appendix 4A:5, 6, and Appendix 5F for examples). If students had been given initial training before iPad lessons started in how to utilize some of the basic affordances of the iPad, this I believe would have led more students having used these affordances than was observed. This in turn could have enabled more effective engagement with the device leading to more language learning occurring.

To summarize, now that I have triangulated and saturated my hypothesis of affordances of the iPad being able to cause student engagement leading to learning outcomes being reached, I believe the evidence I have shown above supports this. However I would now qualify it by adding that the teacher must be aware of several issues:

- Students should initially be trained in the basics of using the iPad in order for them to capitalize on its affordances such as double-clicking the menu button, multi-touch gestures for picture resizing, etc.
- In order for the lesson to continue smoothly and for students to reach targeted learning outcomes, appropriate action needs to be taken in advance of lessons in order to avoid potential hindrances to the iPad’s proper functioning, including compatibility problems with Flash and JavaScript, problems unique to specific apps, etc.

4.4.2 Validating Hypothesis 2

**Hypothesis 2:** Having 1 iPad per student (1:1) tends to lead to increased student engagement and learning outcomes improvement.
In looking at the interview data from both teachers and students, the issue of 2:1 or 1:1 ratios of students at the iPad didn’t arise, i.e. I hadn’t specifically asked students and teachers for feedback on this issue. However, in coordination with the teachers involved, I had planned to have combinations of 2:1 and 1:1 student to iPad ratios, and had asked the question to myself in my Lesson Plan research aims, “What is the advantage of having students work in pairs as opposed to 1:1 contact with the iPad?” (Appendix 2D) A perusal of the video recordings of the classes brought a wealth of insight into this issue.

Firstly, I did notice, more often than not, that those students who were in pairs at a table with one iPad to share tended to eventually get off task, specifically the one student who wasn’t actively using the iPad. In the observation charts in Appendices 5A and 5B, of all the video recordings that show students in off-task behaviour (videos 13, 15, 16, 17, 18, 22 and 29 in App. 5A, and videos 1-5 in App. 5B), 8 out of the total of 12 videos showing off-task behaviour had students working with iPads 2:1. The largest number of off-task incidents came from students working for an extended period of time 2:1 (see App. 5A, video 29, and App. 5B, video 3). In further investing these specific incidents, I observed during the 5th grade lesson containing video 3:

- 1 student needed to ask T a question, got up with iPad but left other student (non-iPad student) inactive. 1:1 would have solved this.
- Non-iPad student has potential to be idle, disengaged cognitively (even though behaviourally they 'look' as if they are engaged', but in this example, the student wasn't taking notes, wasn't reading. The other student was doing the cognitively heavy stuff
- 1:1 iPad usage would have helped both students learn more, or be cognitively more engaged in activity.
- Lack of 1:1 creates engagement problems, low cognitive engagement. More challenging tasks in higher levels must be done 1:1.
- We’ve got to implement 1:1 activities. It’s much better with low iPad number to have half the class work on iPad and the other on something else. Better than 2:1 (Appendix 5H, Figure 11)

![Figure 11: Picture of 2:1 student to iPad ratio in Grade 5](image)

However, in looking at the notes for the Grade 2 video, which was similarly 2:1 over an extended period (18 minutes), I noted the following:
• They tended to wait patiently until their turn.
• Students got off task in brief intervals but went back to task independently.
• Popplet took too long to finish. Should have been done 1:1. [But both] students were excited to finish.
• The off-task behaviour didn't lead to Ss stopping to do the activity, they still finished their task. Certainly no non-lesson games should be available to students for early-finishing; they will tend to use them.
• Late in the day could explain students 'acting up', getting distracted.
• These two kids, despite some mild off-task behaviour, were using the iPad more than 90% of the time. (see Figure 12)

So it seems the causes of these two students’ off-task behaviour was less that they were 2:1 on the iPad and more because of other factors, like the fact that it was the end of the school day and they were distracted by games on the iPad, but only after they had finished their work. As noted, both students were actively involved in the activity and succeed in working together to finish it. And other instances of positive 2:1 usage from Grade 2 students were noted here:

• Pair work works great when one kid is looking at the book, the other is on the iPad typing.
• 2 roles, 2 devices [one reading the book, the other with the iPad].
• Students engaged in collaborative activity at iPad, fulfilling learning goals (Appendix 5L, Figure 13)
Perhaps what could be concluded was that the Grade 5 activity, which required greater cognitive skills (taking notes on research), was better suited to 1:1 iPad usage, but the Grade 2 activity was suitable for collaborative work 2:1.

Another separate incident that substantiates the 5th grade 1:1 claim is the lesson described in Appendix 5I:

“Cognitive engagement in kid who wasn’t as involved at the iPad was low. However, this time the 2nd student was more engaged in that he was trying to help the girl who was on the iPad with spelling (though using L1). So he was involved, so there was more teamwork here than in other example (Grade 5 iPad lesson 2 Day 3). There was much more engagement between the two students, as both wanted to participate actively. Therefore, it’s not that the 2:1 ratio that prevents full cognitive engagement from both students, its more related to the attitude of each student, even though for those students who don’t have interactive-relational skills (argumentative, etc.) it’s harder for them, and those students should use iPads 1:1 to be more cognitively engaged. However (further disclaimer), after a period of about 9 minutes of mainly one student using the iPad, even in this case the second student appeared disengaged or bored. At best he went from periods of boredom/disengagement to involvement/engagement with partner in activity. After watching the whole video, I’d say he was engaged 65-70% of the time, either helping the girl or actively participating, suggesting, etc. Task itself was completed, but only one student was really doing the research, in the sense that it was she who copied it down, typed it in, so only one student reaped the benefits of the activity, language and learning outcome-wise. [Therefore] 1:1 is still the way to go, even with two students who are otherwise active participants, good students, etc.” (Appendix 5I)

So to summarize, 1:1 iPad usage does tend to lead to increased student engagement and learning outcomes improvement, especially when student is cognitively engaged, not just behaviourally. However, collaborative iPad usage in 2:1 ratios can work, especially at lower grade levels with less cognitively challenging tasks appropriate for pairs of students (e.g. one reading a book, the other typing answers to reading questions).

4.4.2 Validating Hypothesis 3

Hypothesis 3: Best practices in ESL teaching must be utilized for iPad to improve learning outcomes.

In order to validate this claim, I will be drawing on sources of data from my research journal notes, interview transcriptions with teachers, and observation notes from the video recordings.

Firstly, in my Researcher Journal I noted:

“Students got going on it very quickly. They still need assistance with some things. [Having the activity go well still] doesn’t disqualify best practices. Apps need to be customized, chosen with teacher in mind [so she can work effectively with the students]. Apps need to be custom designed to achieve learning outcomes.” (Appendix 7D)

This implies that the teacher needs to put thought into planning iPad-based activities, in terms of choosing the right app, looking for customizability in order to achieve learning outcomes.

Similar realizations came from my video recording observation notes from Grade 2 Lesson 3, Day 4:
Students pronouncing L2 spelling with L1 phonology.

Problem of L1 usage during activities, or lack of L2 during collaboration, is still a problem.

ESL best practices still need to be in place to ensure L2 is used. (Appendix 5L)

In this case, it would be a given in best practices for ESL that the teacher would want more L2 usage than L1. Therefore the teacher needs to plan for and set guidelines for L2 usage during collaborative work with iPads.

An example that followed best practices in teaching was a classroom I observed on the first day of iPad lessons with the Grade 5 students. The lesson had half the classroom having iPads and working on them 1:1 while the other half were with the teacher doing small group work. Here are my observations:

- In this class what was great was that the students who had iPads were doing quiet 1:1 work which the teacher needed in order to work with the other half of the class, which was a L2 speaking activity.
- Teacher got to do more personal work with fewer students. A lot of L2 was heard in the background [by the students working with the teacher while I was videoing the iPad students].
- Can't underestimate the value of having half the class on iPads [with students] engaged, allowing teacher to meet specific needs of students in a smaller group. This totally helped learning outcomes of the whole class, i.e. L2 speaking practice, reading comprehension/discussion, reading practice, these were the goals of the lesson. Also vocab enhancement (students discussed the meaning of the word "gannet". Teacher had time to deal with this). (Appendix 5F)

Here was a perfect example of the iPads not only to producing engagement and helping learning outcomes with the students actually using the iPads, but the side effect of half the class being engaged with the iPads meant the other half got much more 1 on 1 time with the teacher, allowing her to achieve her learning outcomes she had planned for the non-iPad students. Later the students would switch activities so that all the students got to work with the teacher a smaller group and work on the iPads.

I had further reflections from my observations on best practices in ESL applying to iPad use in the classroom. I noticed it would be common practice for ESL teachers to draw out the language opportunities of the particular task involved. I noted in the observation notes in Appendix 5J that “you've got to select apps that draw out the language, if you're doing ESL.” The observation chart in 5A shows a lower amount of on-task L2 usage (indicator #3) than L1 (indicator #2). Perhaps the reason there weren’t as many instances of on-task L2 usage was that the apps and iPad online assignments themselves didn’t facilitate or afford L2 discussion between pairs of students using the one iPad. This can in turn lead to the idea that teachers should select specific iPad apps or activities that facilitate and encourage L2 usage between partners (an example could be an app that records voice annotations to a slideshow or picture story).
Another issue that came up in the lessons that showed the need for best practices in ESL concerned the ordering of activities and pacing of the lesson:

- This activity took way too long, especially for pair work [students took a whole period to take notes].
- Very little L2 occurred, wasn't planned well.
- There could have been clearer instructions, a brief summary of how to get bullet points out of a long paragraph, etc.
- [The teacher should have moved] them on to creating their PowerPoint, [insisted on having] discussions be in L2. Choosing the right website that has info that is summarizable to their level is crucial (good teacher practice with tech). (From Grade 5 lesson, Appendix 5H).

From these observations it’s clear that planning and pacing of the lesson should have been better thought out. The teacher also needed to have been aware of the affordances of the iPad Keynote app to collect notes from internet research, which would have saved students time (see final notes in Appendix 5I).

Lastly, one of the affordances of the iPad that can work against learning outcomes is the ability to search the internet easily and quickly, find text and copy paste it into different apps such as Notepad or Keynote, but in the process commit plagiarism (a problem noted in Appendices 5H and 5I). Best practices in ESL would state that plagiarism is bad. Therefore, it would seem logical that to balance the affordances of the iPad (e.g. easy internet search) with achieving learning outcomes (in this case, writing a researched account in student’s own words of how to make chocolate), the student needs clear guidelines and rules for using the iPad in an academically appropriate way. The teacher also needs to recognize the potential misuse of certain affordances of the device that could work counter-effectively to the learning outcomes they want the students to attain.

In summary, it seems clear that my proposed hypothesis, “Best practices in ESL teaching must be utilized for the iPad to improve learning outcome”, stands the test of a triangulation of sources of data from my research, especially in light of some of the noted negative consequences of not applying best teaching practices.

4.5 Interpretation of Hypotheses

Having modified, refined and validated my hypothesis, I will now move on to interpretation, “taking a validated hypothesis and fitting it into a frame of reference that gives it meaning” (Hopkins 2008, p. 136). What I would like to do is now take my hypotheses and relate them to theory, particularly Astin’s theory of engagement or involvement and its interconnectedness with improvements in learning (Astin 1984). Though Astin wrote for primarily a post-secondary education context, I believe that aspects of his theory of involvement can equally apply to all levels of learning, including primary school.
Firstly, Astin indicates that there are “no essential differences between the terms” of involvement and engagement (Axelson & Flick 2011, p. 40), so it is safe to use these terms interchangeably. Astin’s theory of involvement contains five postulates, the first being:

1. Involvement refers to the investment of physical and psychological energy in various objects. The objects may be highly generalized or highly specific. (Astin 1984, p. 519)

In the above discussion on the validation of my hypotheses and throughout my video recording observation notes I have been careful to note instances of behavioural engagement, or what Astin describes as “the investment of physical energy.” I have also tried to observe evidences of psychological energy invested in objects (in this case the iPads). I noted that those students who were in 2:1 student to iPad ratios but not directly using the iPads did not seem to be cognitively engaged with the activity (see Appendices 5H and 5J for examples). They were therefore, according to Astin, not expending psychological energy on the specific object they were involved with, a further support of my second hypothesis.

Astin’s second postulate states:

2. Regardless of its object, involvement occurs along a continuum; that is, different students manifest different degrees of involvement in a given object, and the same student manifests different degrees of involvement in different objects at different times. (Astin 1983, p. 519)

This would explain why in two similar situations where two pairs of students were given one iPad each and assigned the same task, one pair showed more cooperation and shared levels of involvement (Appendix 5I), whereas the other pair didn’t (i.e. the student not using the iPad was uninvolved, see Appendix 5H).

Astin’s third postulate is:

3. Involvement has both quantitative and qualitative features. The extent of a student’s involvement in academic work, for instance, can be measured quantitatively (how many hours the student spends studying) and qualitatively (whether the student reviews and comprehends reading assignments or simply stares at the textbook). (Astin 1983, p. 519)

To the extent that I have measured both quantitative features (observation charts in Appendix 5A-5B) and qualitative features of involvement (observation notes in Appendices 5C-5L), I feel as if I have adequately measured student involvement or engagement within this four day period of the research study.

Fourthly and crucially, Astin postulates that:

4. The amount of student learning and personal development associated with any educational program is directly proportional to the quality and quantity of student involvement in that program. (Astin 1983, p. 519)

Perhaps we would define ‘personal development’ and ‘educational program’ differently in an early primary school context. Nevertheless, here Astin’s seminal and highly influential study
of student involvement and its relationship with student learning substantiates my main hypothesis that the affordances of iPads can cause student engagement leading to improved learning outcomes. What Astin seems to be saying about my research context is that, if iPads facilitate increased student engagement, which my observation data indicates is the case, then that student engagement will be directly proportional to the amount of student learning that can occur in that educational program. In this case, the educational program is an ESL class with specific learning outcomes targeted for each lesson. Therefore, students are achieving learning outcomes in as much as they are expending physical and psychological (behavioural and cognitive) energy in the object they are using, in this case an iPad equipped with level and topic appropriate educational apps and online activities.

Lastly, Astin’s fifth postulate is less about the student and more about teachers and the school as an institution implementing the use of mobile learning devices such as tablet computers in the classroom:

5. The effectiveness of any educational policy or practice is directly related to the capacity of that policy or practice to increase student involvement. (Astin 1984, p. 519)

If we interpret “educational policy or practice” as correlating to “best practices in ESL”, as mentioned in my third hypotheses, then we see clearly that the better the ESL practices are for planning and carrying out classroom activities using iPads, the better the student involvement will be. Astin’s fifth postulate, then, supports my third hypothesis:

**Hypothesis 3:** Best practices in ESL teaching must be utilized for there to be cognitive engagement and improved learning outcomes with students using iPads.

We now know from his fifth postulate that effective educational practices such as those of ESL teachers, if they are truly effective or ‘best’ practices, will have the capacity to increase student involvement. We also know from Astin’s fourth postulate that the quality and quantity of student involvement or cognitive engagement is directly proportional to the amount of student learning that occurs. An increase in student involvement would therefore increase the amount of student learning that occurs, thereby improving learning outcomes, according to Astin.

In assessing the validity of the above claims, I would need to hear a word of caution before applying Astin’s theory whole-sale to my research context. Axelton & Flick (2011) observe that “It is often assumed that engagement is causally related to learning. But the relationship between engagement and learning is far from clear” (p. 42). They go on to argue that highly engaged students could learn nothing if the lessons they are in are poorly planned and conducted (i.e. without best practices in ESL, in my case). They also speculate that “engagement may be a by-product of a learning environment that suits the students” (ibid.
I would agree with this statement in that what I observed from the lessons was students being engaged with aspects of the learning environment that suited them, namely, the perceived playfulness and usefulness of the iPads (Liu & Han 2010, p. 216). As I have already hypothesized, best practices in teaching ESL must be in place to ensure students achieve targeted learning outcomes, despite the novelty factor of the iPads which does not by itself intrinsically lead to learning goals being reached (Davis 2011, also Appendices 4C-4E).

Axelson & Flick do admit, however, that "we know, or at least have reason to believe, that it is better for a student to be engaged—even behaviourally engaged…—than not to be" (2011, p43) and conclude a desire to see more work done on this issue: "We badly need more research on the interaction between engagement and learning" (ibid., p43).
CHAPTER 5  DISCUSSION AND CONCLUSION

5.1 Answers to the Research Question

In reflecting on the interpretation of my hypotheses, I have now arrived at answering my research question with some sense of knowledge and insight into the research topic:

**Research question:** What are the affordances of iPads for improving student engagement and learning outcomes in an ESL classroom?

**Answer:** Affordances of the iPad for improving student engagement and learning outcomes are:

- Its usability for teacher-customized, topic-related websites that are interactive and media-rich (e.g. WordPress based Enkablogs with the embedded videos, questionnaires, HotPotatoes quizzes, etc.). Best practices in ESL and 1:1 student to iPad ratios for all affordance to be effectively utilized to bring about improved student engagement and enable students to achieve learning outcomes.
- The availability of educational apps that are selected specifically for the students’ needs, ability levels
- Its usefulness in running standard apps such as Notepad, Keynote, iBook for note taking, presentations, book reading, etc.
- Its mobility and supplementality in the classroom: useful for translating, searching for definitions in a dictionary, internet browsing, online research (This in turn gives students more autonomy and the teacher more time to address specific needs in the classroom with other students)
- Its touchability and customizability: the iPad’s touch-based, customizable navigation system allows easy access to apps and website icons (thereby enabling teachers to have all apps for a particular classroom or grade level on one home screen or menu panel)
- Its ability to switch easily between applications (e.g. students can simultaneously research information on the internet or watch topic-related videos and take notes on Notepad or other apps).

Note: Best practices in ESL and 1:1 student to iPad ratios for all affordance to be effectively utilized to bring about improved student engagement and enable students to achieve learning outcomes.

Hindrances to using the iPads for improving student engagement and learning outcomes were noted and solutions suggested:

- 2:1 student to iPad ratios caused the one student less active in using the iPad to be less cognitively engaged and potentially led to behavioural disengagement and off-task behaviour.
  - Possible solutions: Enable 1:1 usage as much as possible. If classroom has only small numbers of iPads, differentiate classroom into independent 1:1 iPad users, and teacher-led group.
- The absence of Adobe Flash and JavaScript applet compatibility limited the teacher’s selection of online educational resources.
  - Teacher should troubleshoot websites before planning lessons.
- Students’ lack of awareness of certain iPad affordances caused them to not to use the device optimally.
  - Training is needed before implementing iPad lessons to teach students basic features of iPad
- Multi-touch interactivity problems were noted, namely problems with keyboard usage and practicality of using touch-based features of certain apps
  - Trial and error in using keyboard/apps, or basic training, broken down step by step (perhaps with teacher iPad screen displayed on overhead).
5.2 Plans for Future Action and Implementation

The final step in the process I have been describing is taking action on the research findings. Hopkins states that, “at this stage...the teacher can be certain that the results obtained are valid and trustworthy...Having created meaning out of the research data the teacher-researcher is in a position to plan for future action” (2008, p. 137). Because I am not in the position of being a teacher-researcher, I am instead assisting teachers, through my research, in offering a secure platform for future action, as Hopkins describes. He notes that the whole process of data collection, validation, interpretation and action for development is cyclical in nature, where the action stage is also monitored by classroom research techniques (ibid., p. 137). Thus the whole process is repeated again in a cycle of action research.

This research project was a one-time to use iPads in the classroom for this particular school, but in my interviews with one of the teachers involved in the research we both imagined a day when students would bring tablet computers to school as a requirement much like a pencil case or school books. In fact, while I was in Turkey at Enka Schools, the prime minister did in fact make an announcement predicting iPads in every classroom within four years (Ziberg 2011). The fact that iPads or any other type of tablet computer in the hands of every student within only a few years is promising as well as concerning. One of the commenters on Ziberg’s article stated, “The problem I have is the mad rush to put tablets into schools without proof that they are actually beneficial to the students. In [many] cases the hardware is used for nothing more than a typewriter replacement” (Ziberg 2011). So it is crucial that teachers and school implement a comprehensive strategy in using tablet devices in the classroom in order to achieve maximum student engagement and learning outcomes.

My recommendations for future projects involving the use of iPads in the ESL classroom are based on the eventual normalized acceptance of iPads as tools for education (see Bax (2003) on normalization of CALL, also notes in Appendix 5D). The teachers I interviewed dreamed of that day coming (Appendices 4C, 4D and 4E). That day has already become a reality in many schools that have been the first to extensively adopt tablet computing in the classroom (see Demski (2011), Meister et al. (2011) and Hu (2011) for examples).

As was suggested in the previous chapter, Astin’s (1984) theory for student involvement suggests that institutions must ensure that the quality and quantity of student engagement remains high. A practical suggestion for implementing wide-spread adoption of devices like the iPad in schools would be to create a policy for usage (Harm 2011). Students could receive discounted iPads included in their tuition at the beginning of their schooling (Kaknevicius 2011). The iPads would remain with students during the school year and they
would keep them at home during the summer. The school would need to have primary control over the downloading and syncing of apps on the iPads during the school year in order for teachers to be able to use them to effectively engage students and achieve learning outcomes as described above. Students would be in control of syncing and downloading apps during the summer months.

5.3 Conclusion

In conclusion, I have sought to describe and prove the effectiveness of various affordances the iPad has for ESL learning in the classroom, particularly to improve student engagement and, as a result of this, learning outcomes. I have given suggestions as to which iPad affordances have proven to be effective in fulfilling these goals. By no means is this an exhaustive list, as the case study was narrow in scope, only extending over a period of four days and involving two grade levels of around thirty students. However, I do believe that in the process of analysing my data, validating my hypotheses through triangulation of participants and sources of data, and through saturation of my data, I have come to conclusions relevant to this field of study.

In the end, it is helpful to remember what one of the students I interviewed reflected on: “No one can know how much he [/she] learns” (Appendix 4F:2). The issues of student engagement and student learning through technology remain complex subjects that teachers doing classroom research are only beginning to learn, especially in relation to new mobile technology designed to facilitate these. Despite the digital age of mobile learning we are now living in, with instant access to just about everything, it is still important for teachers and students alike to realize that:

“Clearly, students and institutions each have responsibilities for the quality of student learning. Students need to put forth the effort necessary to develop their knowledge and skills, and institutions need to provide the appropriate environments to facilitate student learning.” (Axelson & Flick 2011, p. 42)
REFERENCES


Re: Educational Technology Research into the use of iPads in ESL classrooms

Dear Parents,

I am a former teacher at Enka Schools who has worked in the English department, Grades 1-2, for 6 years. I am now finishing an MA in Educational Technology and have planned to do research into the use of iPads in English classrooms at Enka Schools from April 25 to April 28, 2011.

I plan to introduce the iPad for educational and language learning purposes to the students in the classroom, and observe them using them for various English activities. I wish to interview each student and collect questionnaire data. This data will be anonymous and nowhere will your child’s name be used in the final project write-up.

I would also like to take a video of the classroom while students are using the iPads. This video is for data collection purposes only and will not be posted online for public viewing.

I kindly request you give your consent to allow your child to participate in this project.

Thank you very much,

Barish Golland

Educational Technology Project Research with iPads at Enka Schools – April 25-28 2011 Consent Form

I hereby give consent for my child, _________________________ (name of child), to participate in the April 25-28 2011 Educational Technology iPad research project held at Enka Schools. I understand that my child may be video recorded and interviewed for the collection of research data but that in no way will their names or video images be made public on the internet or in print.

Signed : __________________________________________
Date : __________________________________________
Appendix 2 - Lesson plans for research project

Appendix 2A: Lesson Plans for iPad Research Project – Day 1

10:15am – Grade 5 Cohort B
- Video interviews with students
- Research aim: interview students regarding iPad familiarity, usage, implementation in classroom

11:00am – Grade 2 Cohort B
- Video interviews with students
- Research aim: interview students regarding iPad familiarity, usage, implementation in classroom

12:00 – 13:30 – Interviews with Teachers
- Research aim: collect initial thoughts about use of iPads in the classroom
  - Whether teachers think this will enhance learning outcomes and engagement
  - What they think about current engagement levels of students
  - What they think of iPads in general, for class use, in language teaching

14:00 Grade 2 Cohort B – 1st iPad Lesson
Learning aims:
- Construct meaningful sentences about ways of reusing recyclable/reusable products
- Generate ideas about how to reuse certain reusable products (plastic bottle, etc.)

Language skills:
- Brainstorming about prior knowledge in relation to reusing of certain products
- Sentence construction using unit-related vocabulary

Pre-class preparation:
- iPads charged, all have Notepad app on them
- Teacher customizes each iPad, typing out on notepad 1 of 5 recyclable products for each iPad with the question. “What else can you make out of ____”

Procedure
1. Half the classroom is selected to do iPad activity (rotating to the other half after the first group of students finish)
2. Teacher shows realia of recyclable products, asks students to think of ways of reusing them
3. Brainstorming about how to reuse products
4. Teacher instructions students to go to tables
5. Those students using the iPads click on the ‘Notepad’ icon
6. Students type in on the notepad sentences for what they would use each recyclable product teacher has listed
7. They then rotate to a different iPad to write a sentence about a different recyclable object

Research aims:
- Observe initial reaction to iPad use in the classroom
- Notice affordances of iPad for typing sentences in English
- Observe and problems or impediments to learning that may occur
- Notice interaction of students with devices, in terms of navigation, touch-based interaction, posture, etc.
- Observe and gauge level of student engagement with iPad devices in terms of student focus on task at hand, degree of distraction or off-task behaviour, ability of student to finish task
Appendix 2B: Lesson Plans for iPad Research Project – Day 2

8:35-9:15 – Grade 2 Cohort A – Non-iPad lesson
- Videoing of a classroom without the use of iPads as a ‘control group’
- Research aim: to see if this would lead to any insights on the difference between a classroom with iPads and a classroom without, asking the question, “Are students any more or less engaged in the lesson not using iPads as opposed to using them?”

12:20 – 13:00 – Grade 2 Cohort B – 2nd iPad Lesson
Learning aims:
- Sequencing of a story into the correct order of events
- Unit-related vocabulary development
- Brainstorming about the uses of a recyclable product

Language skills:
- Word/picture association of vocabulary related to recycling unit
- Reading comprehension of recycling unit related story (Jimmy the Jar)

Pre-class preparation:
- iPads equipped with icon directing students to web link of online Enkablogs site with unit-related content

Procedure:
1. Students are instructed to get into groups of two to work on iPads
2. Students directed to click on Enkablogs Grade 2 website icon on iPad
3. Students instructions to do first pre-reading activity on Enkablogs Grade 2, watching a video about recycling jars
4. Students then instructed to do vocabulary matching exercise
5. Students instructed to read ‘Jimmy Jar Story’ which uses previously tested unit-related vocab.
6. Students do sequencing of story sentences into correct order
7. Students use Blackboard app to draw what they think Jimmy the Jar would be recycled into
8. Early finishers get to write about what they think will happen next in the story

Research aims:
- Explore effectiveness of iPad implementation of WordPress websites customized to curriculum goals and unit of study
- Observe student use of WordPress blog in terms of ease of use and navigation
- Observe student engagement with iPad tasks/activities
- Observe effectiveness of multimedia capabilities of iPad, including YouTube and Google Docs forms
- Observe HotPotatoes JavaScript integration in WordPress on iPad
- Observe ability of students to complete learning tasks on iPads, thereby showing effectiveness of iPads in helping achieve learning outcomes.
- Observe use of Blackboard app in terms of facilitating brainstorming and presentation creation related to unit of study

14:00-14:45 – Grade 5 Cohort B – 1st iPad Lesson
Learning aims:
- Understand schedule section of reading and be able to answer comprehension questions about the reading

Language skills:
- Reading comprehension skills
- Vocabulary building

Pre-class preparation:
- All students should have their books and 1 iPad per student.
- Class is divided into Language Arts (higher level) and Language Development (lower level)

Procedure:
1. Students in Language Arts and Language Development alternate use of iPads
2. Each group reads the chapter assigned by the teacher, then goes to the iPad to answer the reading comprehension questions.
3. Students access the reading comprehension quiz by clicking on the Enkablogs Grade 5 icon on the iPad, then clicking on the reading section and onto their appropriate book’s quiz.
4. Students fill out quiz.
5. Early finishers: may do Sentence Builder app.

Research aims:
- Observe integration of Google Docs into WordPress blogs on iPad
- Observe ease of use, navigation, engagement of students with Google Docs forms on iPad
- Observe student typing skills on iPad
- Observe student interaction with each other, level of noise, amount of L1 spoken
- Observe differences between higher and lower groups
- Observe any unanticipated problems, affordances in use of iPads
Appendix 2C: Lesson Plans for iPad Research Project – Day 3

8:30-9:15 – Grade 2 Cohort A – 1st iPad Lesson

- See Grade 2 Cohort B 2nd iPad Lesson on Day 2 for research aims, learning and language aims, procedure, etc.

10:15 – 10:55 – Grade 5 Cohort B – 2nd iPad Lesson

14:00 – 14:45 – Grade 5 Cohort B – 3rd iPad Lesson

Learning aims:
- Students use iPads to research and present on the production of chocolate
- Students learn about how chocolate is made

Language skills:
- Vocabulary related to chocolate and chocolate production
- Writing skills: note taking for research project
- Presentation skills: summarizing what they have learned in a PowerPoint/Keynote with graphics/pictures

Pre-class preparation:
- iPads with Enkablogs Grade 5 site icon, chocolate production related activities

Procedure:
1. Students work in pairs at tables to explore videos and internet research related to chocolate production
2. Students first go to Enkablogs.com Grade 5 site, click on How Chocolate is made activity
3. Students listen to chocolate production video and take notes.
4. Students also visit websites related to chocolate production and take notes
5. Students may take notes on the iPad with the Notepad app
6. Students prepare to transfer research to an iPad Keynote presentation
7. Students create iPad Keynote presentations about their findings.
8. Students email/export Keynote to teacher for future presentation in class

Research aims/questions:
- Observe students' interaction with iPads. Can they navigate?
- Do they make use of affordances of iPad, i.e. multi-touch, double-click menu button, etc.
- To what extent are students on task? Do they go to apps or sites unrelated to the lesson? I.e. do they get distracted?
- How much does the lack of flash capabilities on the iPad impede lesson objectives?
- How easy is Keynote to work with in terms of students preparing presentations?
- How easy is it for students to note take on iPads?
Appendix 2D: Lesson Plans for iPad Research Project – Day 4

10:15 – 10:55 – Grade 5 Cohort B – 4th iPad Lesson
Learning aims:
• Students use graphical aids (mind-maps) in summarizing chapter events in a story
Language skills:
• Summarizing a chapter in a story in writing and orally
• Sequencing events in order
• Sentence construction, grammar and spelling related to describing the events in a story
Pre-class preparation:
• iPads equipped with Popplet application
Procedure:
1. Students come to class having read the specified chapter in their book which they will be summarizing.
2. Students open up the Popplet application on the iPad
3. Students create bubbles for text and pictures, and link them together in a sequence
4. Students asked to write 3 paragraphs of what happened, first, next and last in the chapter
5. Students may illustrate with drawings on the iPad or copy/paste images related to the chapter events
6. If time remains, students present their work to the teacher orally, describing and summarizing the chapter
Research aims / questions:
• How well is the Popplet mind mapping application suited for summarizing chapters in stories?
• Did the use of iPads enhance the learning outcomes of the lesson?
• Did students speak mostly in L2 or L1?
• To what extent did students stay on task and to what extent did they get distracted (i.e. do things on the iPad unrelated to the lesson?)
• How easy was it to use the Popplet mind mapping application in terms of creating text bubbles, copy/pasting images, drawing, etc.?
• What is the advantage of having students work in pairs as opposed to 1:1 contact with the iPad?

11:00 – 11:35 Post-assessment interviews with Grade 5 students
Questions to ask students:
• How much did you like learning English in this class? Why?
• What ideas did the iPad give you for better ways of learning?
• What did you think about the iPads? Why so?
• Were they easy to use? How?
• Do you think the iPads helped you learn English more? Why? Or How?
• Were the iPads useful in the classroom? Why?

12:20 –12:55 Grade 2 Cohort A – 2nd iPad Lesson &
14:45 -15:30 - Grade 2 Cohort B – 3rd iPad Lesson
Learning aims:
• Students conceptualize story into sequential parts
• Students summarize story
Language skills:
• Sentence production about events in a story
• Sequencing the events in story in terms of first, then, next, finally, etc.
• Students able to describe and summarize events in a story orally and in writing
Pre-class preparation:
• iPads equipped with Popplet mind-mapping application
• Popplet program prepared with 3 interconnected text bubbles with the numbers 1, 2, 3 in sequential order
Procedure:
1. Students work in pairs to complete task
2. Students instructed to summarize story they are reading into main parts, first, next, finally.
3. Students may illustrate story with drawings on iPad or images from web
4. Students type out sentences into text bubbles on iPad, connect bubbles in sequence in the story
5. Teacher takes snapshot image of completed work for future oral presentation
Research aims:
• How do the Grade 2 students use this app as compared to the Grade 5 students? Any differences?
• How much does this activity facilitate discussion in L2?
• Is this more practical / feasible / effective than the same activity with paper and pencil?
• How much teacher assistance is needed for this activity?
• Did students enjoy it, i.e. were they engaged with the activity? To what extent?
• What is the advantage of having students work in pairs as opposed to 1:1 contact with the iPad?

13:30-14:45 – Post-lesson interviews with Grade 2 and 5 teachers
Research aims:
• Gather teachers’ thoughts, reflections on the iPad lessons of the past 4 days
• What worked, what didn’t work? Suprises?
• Would they want to implement this all year long, consistently?
• Are iPads useful for enhancing/improving learning outcomes and engagement of students?
Appendix 3 - Samples of iPad activities

Appendix 3A: Enkablogs Grade 2 Recycling Unit Pages (http://20102011.enkablogs.com/eng2)

Chapter 1

Hi, my name is Jimmy the Jar.

A month ago, John bought me at a supermarket. I was filled with strawberry jam.

John took me home and ate all the strawberry jam.
Appendix 3B: Enkablogs Grade 2 Recycling Unit HotPotatoes Exercises

Jimmy Jar Story Matching Exercise

Match the correct word to the picture on the left.

Check

a recycling truck
an empty jar
lanterns
a cookie jar
marbles
a bird feed
a recycle bin

Match the correct word to the picture on the left.

Check

Finally, a truck came to take me away.
After that, I was used as a jar for marbles.
Then, I became a lantern with other friends.
Then, I became a cookie jar.
After that, I was put into a recycle bin.
Next, I was a bird feeder in the garden.
First, I was strawberry jam.
Appendix 3C: Enkablogs Grade 2 Recycling Unit Google Docs Form

**Jimmy the Jar - What happens next?**

* Required
What do you think will happen to Jimmy? *
Write one or two sentences

Write your name here: *

Submit

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3D: iPad Apps for Grade 2 English Lessons

1. Notepad example:
2. Popplet App. Screen examples:
Appendix 3E: Grade 5 Enkablogs Production Unit Page (http://20102011.enkablogs.com/eng5)
Appendix 3F: Grade 5 Enkablogs Reading Unit Page

ENKA SCHOOLS – Grade 5

Archive for the ‘Reading’ Category

Questions for Aliens for Breakfast – Chapter 1

Questions for Kensuke’s Kindgom, Chapter 1

Click on the link to answer the questions:
Appendix 3G: Grade 5 Enkablogs Reading Unit Google Docs Reading Comp. Quizzes

1. Language Development Reading Comprehension Quiz:

Questions for Aliens for Breakfast - Chapter 1

* Required

Why didn't Richard like his sneakers? *

Who is Aric? *
Use 2-3 sentences.

What's Aric's mission, goal or job? *
2. Language Arts Reading Comprehension Quiz:

**Kensuke's Kingdom - Chapter 1**

* Required

**Describe Michael's childhood, before the letter came. How was it like?** *
Write 2-3 sentences

**Why was Michael doing a paper round? What was the problem saving up money?** *

**What does "being made redundant" mean?** *
- getting a promotion
- getting fired
- losing your job
- being insulted

**How did the family change after the letter came?** *
Write 3-4 sentences.
Appendix 3H: iPad menu panel icons for ESL classes

1. iPad menu panel for Grade 2

2. iPad menu panel for Grade 5
Appendix 4 - Interview transcriptions

Appendix 4A: Excerpts from Grade 5 student pre-lesson interviews

1. Interview with Student 1 in Grade 5, Day 1
Researcher: Have you used an iPad before?
Student 1: Yeah
R: Ok so what do you think about it?
S1: I think it’s a very good machine.
R: Yeah.
S1: And...I don’t know....
R: Do you think that you can use this in school to do work.
S1: Maybe, yes, like instead of computers you can use those.
R: Ok, and in English class do you think you could... what happens if you use them? What do you think will happen if you use them?
S1: It could help us when we are working making some group works.
R: And would that make you, would it be, would... em... do you think it would make you like learning English more? Would you like to come to English class more?
S1: Yeah
R: Why?
S1: Because I like technology and I think it’s very cool, technology.
R: ...so do you have an iPad?
S1: Yeah
R: ...so what do you do on the iPad?
S1: I have books and games in it. I play those games and my dad reads newspaper. And we have iBook’s. I read it from there.
R: So you read books. How is reading a book on an iPad, is it nice?
S1: It’s very difficult but it’s nice.
R: Difficult? Why is it difficult?
S1: Because sometimes when you like to switch a page, it’s more hard. You should go up the bottom and then switch.
R: So do you think sometimes a book is better?
S1: Yeah
R: Ok
S1: And also I use it to get internet.
R: Ahh ok

2. Interview with Student 2 in Grade 5, Day 1
R: Ok, so...... have you seen an iPad before?
S2: Yes
R: Do you have one at home?
S2: No
R: Have you used one before?
S2: Yes
R: And what do you think....do you think it’s good to use an iPad in the classroom?
S2: Yes.
R: Why?
S2: Because that’s little and maybe if you need to search something in the internet you can go in to the internet and search something.
R: Ok, nice. And... how do you think this can make you learn English better?
S2: ....maybe in iPad maybe if there was writing English.. maybe we can... when we are reading something in iPad we can learn much how to speak English.
R: Ok, and then....so do you think you will me more interested in English class if you have an iPad?
S2: Yes
R: Like...sometimes?
S2: Yes
R: Why do you think iPad is fun?
S2: Because.... it’s...how can I say? .... It’s . I forgot that word in English... You can search something like... search something very easily in iPad.
R: Cool. ok.

3. Interview with Student 3 in Grade 5, Day 1
R: Have you used an iPad before?
S3: Yes I have one at home.
R: Good. What do you think about using an iPad in the classroom.. like do you think it is a good idea?
S3: I think it’s a very good idea.
R: Why?
S3: Because it’s easier to use electronical devices rather than writing. Because iPad is a really smart thing and like.. you don’t need to use computers. There’s an iPad. You like... close it.. and then look at Safari. And then...
R: You go on the internet, right?
S3: You go on the internet and it’s much more easier.
R: Yeah.. and can you type on it and write on it?
S3: Yes I’m fast on it.
R: Oh, wow. ... so you think in the classroom you can use it for the internet. Anything else?
S3: Ah...yes. Like.... sometimes like... people forget their books and there’s an app called iBook’s, something like that. And we could just download books from there for free and then we can read from there.
R: So in the classroom what can you do.. what better things can you do...[with technology]
S3: I think we should do more kinaesthetic stuff....[typing at the same time]
R: Wow .. [iPad fixes spelling of kinaesthetic] it fixed your writing... very cool.
S3: Yes and that’s ... we can like... when it fixed it sometimes...and its... it fixes it and we can learn it.. real spelling...
R: Ah.. cool.
S3: Kinaesthetic stuff.. and .. more visual stuff rather than just learning....
R: Ok. That’s good.
S3: And I like using electronical devices. [types some more on iPad]

4. Interview with Student 4 in Grade 5, Day 1
R: Have you used an iPad before?
S4: Yes
R: Do you have one at home
S4: My dad have.
R: ...what do you think about using an iPad in the classroom? Is that a good idea?
S4: Yes because the notebook [laptop] is very big and I don’t like ...because the small and I couldn’t write the notebook [seems to be saying the keyboard was small to type on].
R: So it’s [the iPad] easier to use?
S4: Yes
R: What else is good about iPad in the classroom?
S4: Maybe... my friends learn the iPad or we can ...I told to my mom and take the new iPad...
R: Ok and... in English classroom... do you think it would be... if we had iPads in the classroom it would be more fun.
S4: Yes
R: Why?
S4: Because the... I don’t know but I like iPad . That’s so fun...
R: Ok. How can you learn English with an iPad?
S4: Maybe we can... I forget the one site [website] and this [website] just in the iPad. And we learn that...
R: Ok so there is something special we can learn with the iPad...Ok.

5. Interview with Student 5 in Grade 5, Day 1
R: So have you used the iPad before?
S5: Yes, my mom has.
R: You’re mom has one, ok. And do you like using them?
S5: Yes.
R: And what do you think about using them in the classroom, like in English class?
S5: I don’t know. It would be interesting but the computers are like same for learning because two of them have Safari like you know internet. Because we mostly use internet and PowerPoint in English and there is no PowerPoint in iPad.
R: No PowerPoint in iPad, that’s a good point. ...So is that bad?
S5: Because we use it [PowerPoint] so much.
R: Ok ...So like.. What can we use the iPad for in English class?
S5: Maybe we can look in Safari. We can do presentations. But I don’t know what else we can do.

6. Interview with Student 6 in Grade 5, Day 1
R: Have you used an iPad before?
S6: No
R: Do you think we can use this in the classroom?
S6: Yes
R: What can we do?
S6: Search....
R: Search the internet? Do you think we can learn English with an iPad?
S6: Yes.
R: Like what.. What can you do...?
S6: Look to the dictionary.
7. Interview with Student 7 in Grade 5, Day 1
R: Have you used an iPad before?
S7: Yes, my father has one.
R: Do you think that if we have this in an English classroom, do you think this is good? We can use it?
S7: Maybe.
R: ... Do you think you can learn English with an iPad?
S7: Yes it is the same work as with a computer.
R: And what do you think you can do with it?
S7: I can do some search, I can play games with it. And I can learn information and translations. Like Turkish to English or some other languages. And I can take some photos or load some photos. I can listen to music.
R: But is that for English?
S7: Yes maybe.

Appendix 4B: Notes from Grade 2 pre-assessment interviews on Day 1

<table>
<thead>
<tr>
<th>S #</th>
<th>Have you used an iPad before?</th>
<th>Do you have an iPad at home?</th>
<th>Do you like using the iPad?</th>
<th>How do you think you can use it in English class?</th>
<th>What other ways can we use it to learn English?</th>
<th>Observation notes</th>
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<td>1</td>
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<td>No</td>
<td>Yes</td>
<td>We can press the screen. We can do whatever we want to the screen.</td>
<td>Because there are programs in the iPad you can learn.</td>
<td>Aware of apps, aware of touch-based affordances.</td>
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<td>Mom and dad have one</td>
<td>Yes</td>
<td>There is Google. You can find something. Teacher can use games and something else in that.</td>
<td>You can play English games.</td>
<td>Thinks learning can be fun with iPad.</td>
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<td>Yes</td>
<td>Don’t know.</td>
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<td>Basic awareness of iPads</td>
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<td>Yes</td>
<td>Yes. Use to research. Internet. Can be useful.</td>
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<td>No</td>
<td>Yes</td>
<td>Fun. But electronics can waste your time. Use instead of paper. Not wasting paper. Learning English. Sometimes if you put games in iPad, ABC, you could learn how to read and write.</td>
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<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes. English games. Anything like that.</td>
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Appendix 4C: Excerpts from pre-lesson interview with Grade 2 teacher

R: So to what extent do you feel your students are engaged in learning English with the current tools at your disposal. So..how would you measure the current engagement..

T: ...for this age group it really depends on the time of day. For example, whenever we use technology, whenever I have the Mimio digital whiteboard, the child who is up and doing it is really engaged. However those that are actually watching this digital display are not really engaged, whereas if everybody had a card in their hand, they’re more engaged. It really depends on the context.

R: Ok. so in the classroom to what extent do you feel like you’re achieving your learning goals.

T: Not as much as I would like to...some of the boys especially... I have very active boys .. you’ll see when you film ... they are not really into it, they have very low English levels and they’re not very interested at all.

R: So they’re not engaged? Or...

T: They’re not engaged.

R: Most of the time or some of the ...

T: Oh one of them I’d say 95 percent of the time he’s not engaged. ...I was suggested I might want to put him down in front of a computer with learning software so he stops.. so he learns a little but he stops disturbing the class as well, ...(in this way he)will be more engaged. However I am reluctant to do it in the sense that it’s going to seem like he’ll be getting a reward. Because having technology in the classroom is a reward. If we had it in abundance...if all the kids had easy access to it [technology], it would be easy to put him aside in the circle time with educational software. But [for] all the other kids... you know, when you bring in a laptop, when you bring in a computer or an iPad, all the kids want to have a go, so giving it to the most disturbing child doesn’t really...

R: It’s like a reward.

T: It does. And I don’t want him to get use to fact that he can act up and just be put aside with a computer.

R: So you don’t think it’s the solution for hyperactive kids.

T: I actually do. I do. I would definitely do it, however it also needs to be easy access to all the other students. For example if there’s a .. if I had an extra laptop, or an iPad, and all my kids who finish could have easy access to it, then plucking the hyperactive kid at the beginning of the class, during your circle time, in front of the computer, and then taking him off when it’s table time, would work. However I only have one laptop. And that doesn’t really work.

R: So it’s a matter of fairness.

T: For me I don’t want to deal with the problem [of students saying] “Oh when do I get a computer turn.” I have 16 kids, rotating them would be a nightmare.

R: So ...what are your initial thoughts about iPads in the classroom..

T: I mean, like I said we ...16 kids. I would say if we had 8 to share around [with other grade 2 English classrooms], I’m not saying just for my classroom... because you’re not going to be using it every lesson

R: Yeah

T: But if the entire grade level had 8 iPads or 8 Netbooks like the upstairs 5th graders teachers ([they] have 5 netbooks for each class), then you can actually rotate and actually have one lesson a week, where you actually bring out the computer option, and when you bring it out the problem of fairness will go away. And.. the problem of fairness goes away then you can actually pluck down any child , say “Today you’re working on the computer, but none of the other kids will
be .. [jealous] because they would ..have had access to it.
R: So availability...
T: Just a few weeks ago we wrote stories. And last one I gave the
option... one of my students asked “can I type mine up.” It was a
student initiated thing. And I said “Sure you can.” Then I said,
“Would anybody else like to type it up?” And I had a [feeling], I was
expecting the entire class to say “Me, me, me, me.” But I had
surprisingly ... not all of them were that desperate. So we had 5 or 6
of them working on computers and the rest were writing it out, drawing
pictures. It was good.
R: Do you see any advantage of the netbook over the iPad or vice versa
or...
T: Not at the moment but at the end of the week I will tell you.
Because I haven’t quite used .. an iPad. Did you say netbook?
R: Yeah, both.
T: Netbook, I think ... our computer department is trying to say big
computers are better but I find the netbooks so much easier because
it’s ...[saves] space...you put it on the table , you can put them
outside. It’s very small ...safe.. Of course there’s the disadvantages
of charging them, of taking information from them. You always have to
have your USB stick or have a Google Docs. I would say the same thing
would go for iPads. I don’t know how you would get kids work off an
iPad onto your computer. It needs to have a easy access.
R: It needs to have easy access. Ok that’s important thing.
T: Yeah. I don’t know if they have ... I saw on their website [www.apple.com]
there’s an iPad dock for the teacher. I wondered when you put them on
[do] they connect to your computer?
R: Good questions, yeah. Do you.. see... the use of the iPads, in terms of
what it can be most useful for...Do you see it as being most useful
for engaging students, you know, as an ends in itself or are you
interested in the actual content.. or the content that’s available on
the iPad that is not available elsewhere...or are you interested in
the sort of the interface...
T: I actually think at one point, it’s going to be replacing everything
you have in the classroom. To a certain extent, yes. And it would be
so much easier for organization skills. Because [with] one iPad the
child will have their reading book... so if for example instead of
having the [reading book], you would just say, ”Ok get to your reading
book [on the iPad]” and it will be there, and I love the fact that it
does turn pages, virtual books. Also you would also say, “Ok open up
the documents [apps]” I know they have really cool software for where
you had different tags of different notebooks. You would say, “Open up
your reading book related notes.” They would write their notes there.
And so [it’s all organized]. Instead of going and putting your book it
would be just one book [iPad] with storing everything.
R: Wow. Cool.
T: You could send homework. They can.. easily upload homework on there and
they would be just taking it home. And you know you could be checking
it from home to see if anybody did their homework. I’m guessing I’m
like [stretching out arms, i.e. thinking big picture]
R: Great, that’s a great idea. Thank you very much.
Appendix 4D: Excerpts from post-lesson interview with Grade 5 teacher on Day 4

R: What did you think about the whole project [i.e. having iPads in the classroom]?

T: Nothing else but iPads only? Or besides other [iPad] resources [affordances] to... you know... support [in-class work using iPads]... or just you know turn it into like [an all-purpose learning tool]... cause you can download eBooks and all the other things and you can totally get rid of all school materials.

R: That’s right, [the other teacher from grade 2] was saying that too.

T: So, they can take notes on Notepad and they can prepare PowerPoint presentations, they can read books, they can research, so all the materials they need will be... iPads.... what I observed was students were totally engaged in what they were doing and they loved using it [the iPads]. However my concern is [that it is] such a new technology so they are excited about it. It was like that when they first had their ...netbooks in class but after some time they were not interested in those as much.

R: Ah.. the novelty wore off.

T:.. At the very first lessons they were using it [the netbooks], they were fighting over to...you know...[in order to] get one and use it, but lately it’s not a big deal for them right now. So what I’m thinking is once they get used to it [the iPads] it might lose its ...ah.. power on them. And... ah.. the other thing.. there are some distractions... the other applications might distract them as well.

R: Yeah.. the teacher has control over that

T: Hmmm

R: You can choose to add or [take out apps from the iPad menu pages]... but certainly the internet is right there so...[there’s a potential for abuse]

T: Yeah ....yeah actually that’s the same problem with the use of netbooks

R: Right

T:... I loved seeing them so engaged and they did what they were supposed to do. All the tasks were complete except for I think the research part because of the amount of the task was more than the others so they couldn’t complete it. But other than that those four days for that class was very productive and... fun!

R: Great... so did you notice they were happier learning English with them [the iPads] or it was just fun to use? Did you see a certain satisfaction in.[using the iPads for English activities]?

T: I think we needed more time to observe this, because you know they knew that this week was the only week. So they were more excited about... but if they knew that the rest year they would be using iPads ... we needed more time to say something definite I think.

R: That’s right. Yeah... the issue of novelty,... the novelty wears off... it’s a big factor... they could get bored from it... but... so it has to be something useful and practical, yes?

T: But definitely when I compare it to the handouts that we generally use... like comprehension questions ... They’re [the students] not great fan of those types of activities but what I saw was they were willing to...you know... type in something so... even my low students were trying to type some answers ...

R: Yeah that was a good one. They were very eager to do it. Almost regardless of the fact that it took kind of the same brain power to [finish the activity]

T: ... to be willing to use the iPad [i.e. their eagerness to use it, their engagement with it] also forces them to do the activity because that was the task and you needed iPad so... in order to use the iPad you were supposed to ... [laugh] write some answers...
R: But that might wear out, you might say, I mean it could wear off, where, “Oh, I don’t want to do this” you know. Yeah, ok. Would you be willing...let’s say if... you know how we went to www.enkablogs.com. Would you be willing to upload information or content or exercises, activities?

T: Definitely, definitely... What impressed me this week was the use of Enkablogs

R: Really?

T: To be honest I’m not really confident using technology. I’m trying to use some but knowledge wise I don’t feel that confident. But what I saw... Where they type in their answers, and I was supposed to see them at that time and make corrections share with them. That’s I think a great [affordance of Google Docs]

R: Ok great. Ok thanks.

Appendix 4E: Excerpts from post-lesson interview with Grade 2 teacher on Day 4

R: So how did you feel it went in general?

T: In general... these kids were excited to have them and to play around with them. But I was also wondering if you had them all the time in the classroom, would the novelty of having them wear off.

R: OK, so yeah, is that an advantage or a disadvantage to have it...so?

T: I don’t know you’ll ... It’ll have to see... I mean, right now both of us noticed needs [problems] that it has. Those hindrances, if you have the iPads for a long time... it could actually be... “Oh God I don’t want to do this with the kids” because it has, like, difficulties.

R: What kind of difficulties?

T: For example... the typing we were doing today. You can’t really, like, [navigate because] there [are] no arrows... You can’t really manipulate... you have to...like...keep tapping exactly where it is...and it was kind of difficult. I mean if you had it the whole time the kids might give up after a while because it’s difficult. It’s not easy. They might just prefer the pencil and paper [instead of] erasing that thing [the iPad].

R: Yeah, so the usefulness [affordances] of the application is based on practicality.

T: Practicability. It needs more .. it’s a .. still... it’s a very nice big toy. It needs a few more applications to gather....[be] ready for the teacher to use.

R: Now you as a teacher, would you think it worth your while; let’s say if you had iPads in your classroom, to do that research into finding the right app?

T: I would. Finding applications for an iPad is easy.

R: ... yeah.

T: It’s got... the Apple Store is one of the easiest things to navigate. Sounds like a commercial but Apple Store is easy to navigate. I mean, if there was a section for them, all you would have to [do].is to go through the application, picked the one that worked for you, try it out and see if it works.

R: Ok, ...do you think... it helped student engagement? Like if you were to...say, “The iPad’s great for one thing” would it be engagement, would it be achieving learning outcomes, helping with English?

T: I think it's.. it was perfect for... watching the videos.[they] were good. And...those kids who wanted to watch it again and again, watched it again and again. Whereas in a big class you have the whole mentality “No... no we don’t want to watch it again.” ...that child who wants to watch it again is just a click away. [the student] just clicks it and watches it again. And those kids who don’t, move on. So you don’t have that whole...
R: So it’s customized for the needs of individual students.
T: Yes it is. You can work at it.. you can work at the technology at your own pace.. but you can also do that with a netbook or a computer. iPads were a little difficult to write with. I don’t know if they had ... we had this discussion.. if they had a special pen...For example all the drawing, all the writing, that handwriting application that you had... would be great if the child had a plastic pen
R: Like a stylus, right?
T: Yeah, to go along with it because.. rarely do we write with our fingers, especially at this age [because] it’s hard , but if they had a pen [stylus] ...[they] could be really writing.
R: Ok, right. Ok so there [are] certain things about the actual product that need to change...
T: Yes.. especially if you’re writing. For example if you’re writing... I know one of the things is.. when the kids write they put their hand on it [the iPad] so it has to be.. I don’t know if an iPad would actually .. suddenly become [partially unresponsive to multi-touch, where] this is the only part where you can touch whereas everywhere else it’s going to go not touchable.
R: Yeah... it’ll have to be pretty smart to... be able to detect your palm of your hand and the stylus.
T. I mean it’s hard to teach the kids to ….I mean even if.. we don’t lift our hands while [writing on the iPad].. but if.. that writing application was at the bottom of the page [of the iPad screen]. So that that means your hand would be...
R: ...Sort of mid-air?
T: [it] would be on the side of the iPad so it actually can work.
R: OK and.. let’s say if Apple made all those changes and stuff, I mean , is it still worth it over a notebook [netbook], you know?
T: I think.. yeah, I mean it would be.. imagine.. we were talking about this.. have all your levelled readers on an iPad, it’s an application [specific to this], and all the levelled [readers] are here. And [these] kids.. like, the online A-Z [http://www.readinga-z.com], higher levels for the kids is locked. So every kid has an [iPad], they’re reading at their level, their doing the thing and they’re moving on. And the iPad is so much more close to a book. [One] would say “why would you not have a computer then..” iPad is so much more like a book.. they [students] can sit, they can lift [the iPad], they can sit back, they can take it on to a pillow. It’s more physically easier, so like for example if you had iPads and A-Z online books available on it [now available at http://books.readsmart.com/LAZ/library.html], everybody could be working on their own level in the classroom, no problem. You wouldn’t have the noise, you wouldn’t have the whole “Where’s my book, I’ve lost my book” all you would have to find is the right iPad. “This is my iPad”. And.. I think the kids could easily.. I mean every single kid ... how many of the kids in the classroom by a show of hands had an iPad? So it’s easy for a school to say...
R: Bring your iPads..
T: .. When you register your child, your child should have an iPad.
R: Well, that could only happen with a private school I guess.
T: It can only happen with private schools but you sent me the link for that ... when the prime minister [of Turkey] said “everybody will have an iPad” so that means .. you know, everybody will have an iPad.
Appendix 4F: Excerpts from post-lesson interviews with Grade 5 students on Day 4
[Based on student numbering from pre-lesson interviews]

1. Interview with Student 4 in Grade 5, Day 4
R: How much did you like learning English with the iPads?
S: I loved [it] so much because I learn to write spellings too.
R: So it helped you with English?
S: Yes.
R: It helped you with spelling.
S: Yes.
R: Anything else? It helped you write, spelling, anything else?
S: Write, spelling, and... iPad learn the.. some pictures... understand [word picture association from sites like image search on Google helped student understand words in English].
R: Was it easy to use?
S: Yes because iPad look like laptop too.

2. Interview with Student 5 in Grade 5, Day 4
R: How much did you like learning English in the classroom with iPads?
S: I liked it. I liked it. It was good. I really liked it. It’s more easy.
R: More easy to use? Or to do what?
S: To do the lessons.
R: More easy... because why?
S: Because it’s more easier to search and these. You don’t need to look to the books so much. You can even look to the RedHouse [Turkish/English dictionary app] in the iPad too. You can do everything.
R: Do you think it helped you learn English, or...
S: I think yes, but no one can know how much he learns.

3. Interview with Student 7 in Grade 5, Day 4
R: How much did you like learning English in the classroom with iPads?
S: It’s lovely. I liked it.
R: Easy to use?
S: It’s easier than laptops, because when you touch it it works, and it doesn’t have a mouse. And it’s quick and it’s useful.
R: Do you think it’s useful for learning English? How?
S: Yes because there’s lots of sites [apps] and it’s so practical. And we have fun and learn.

4. Interview with Student 8 in Grade 5, Day 4
R: What did you think about the iPads?
S: I didn’t think too much things. I think because in my home I’ve got an iPad. But it’s just like using a computer. ....
R: Do you think it helped you learn English?
S: Writing...
R: How?
S: Because ..sometimes I am not good write and there is a you ..thing [the iPad corrects your spelling] and I can write some...good [I can write correctly].
R: Ok, it helps you write. ..Do you think it helps you in terms of your motivation to learn English? Are you more motivated to learn when using the iPads?
S: Sometimes.

5. Interview with Student 9 in Grade 5, Day 4
R: How much did you like learning English in the classroom with the iPad?
S: It’s so fun.
R: Ok. Why?
S: Well normally we are writing and we use a lot of time. And now [using iPads] it’s coming easier. And if you wanted to erase something, it’s more easier too. Everything is easier.
R:... Do you think that will help you learn English?
S: Yes because we will have more time and we can learn more things.
R: Ah, that’s a good suggestion. More time to learn more things.

6. Interview with Student 10 in Grade 5, Day 4
R: How much did you like using iPads?
S: I like so much.
R: Yeah, why?
S: Because with iPads I want to do more.
R: Yeah?
S: and... it’s so good. and it has a big screen.
R: How do you think it helps you learn English
S:I think I learn more English .. with iPad because I can .... I want to do...
R: Hmm?
S: Because I want to do it.
R: Oh, you’re motivated, yes.
### Appendix 5A: Video observations checklist results of 2nd Grade Students in iPad Lessons

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Appendix 5B: Video observation checklist results for 5th Grade Students in iPad Lessons

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On-task and Off-task Behaviour Chart Key:

**On-task behaviour:**

1. Stays on task to complete the app-based or website assignment (Tally per iPad)
2. Talks in L1 related to the assignment (Tally per student)
3. Talks in L2 related to the assignment (Tally per student)
4. Ask teacher/peer for guidance/assistance in completing task (Tally per student)
5. Shares device, works cooperatively (Tally per iPad)
6. Stays on app/website related to topic being studied (Tally per iPad)

**Off-task behaviour:**

7. Does not stay on task to complete assignment (Tally per iPad)
8. Talks in L1 unrelated to assignment (Tally per student)
9. Talks in L2 unrelated to assignment (Tally per student)
10. Stalls when doesn’t know what to do (Tally per student)
11. Does not share device, not cooperative with peers (Tally per student)
12. Does not stay on app/website related to topic. (Tally per iPad)
Appendix 5C: Observation notes from Grade 2 Cohort B – 1st iPad Lesson – Day 1

Lesson Description: Students use Notepad app on iPads to write sentences related to Recycling unit

Observations on student engagement with iPads

- PW enables troubleshooting, helping each other to use device (one with more experience), enabling students to continue with work, not interrupt the teacher. Students were willing to 'stick it out' and keep trying until they figured out (i.e. In this case how to move the cursor down)
- Students were completing task. Students seemed fine working with iPad. Relaxed. On task. Sharing iPad (i.e. Both students were involved in activity).
- Students both involved with task, one student helping other.
- Student typing slowly but staying on task.
- Students used extra iPad (researcher's) to locate the Turkish translation of for the word "wheel", then typed it on the iPad to finish the task. One iPad can be used to help another. Or two iPads can be used by one student or pairs of students, in different roles to complete one task
- The activity sustained a group of three students, 2 not even using the iPad, to work cooperatively together to finish a task. All looked interested and gave their full attention to it.
- Students on task, though class noise is high (including teacher's voice). Students are all on tasks (9 students)
- Student at iPad on task, working quietly.
- Student describes iPad activity as "fun"
- 2 Students describe iPad as "easy" to type on, like working on the iPad because it is "electronic"
- Students were working together on task, touching iPad by both students didn't hinder finishing task. Both were involved.
- The student who wasn't using the iPad appeared slightly bored, but still stayed with task.
- Students in pairs and individually all on task. No off-task behaviour
- Students had brief argument over who would use iPad. Students were on task however
- Student Y appeared frustrated over keyboard operation
- Student X seemed to not be able to finish task before class was over

Observations about Ss achieving learning outcomes with iPads.

- Students were able to complete L2 task of typing out what the other uses of a toilet roll can be.
- Speaking in L2, reading off of iPad in L2. Typing/writing in L2.
- Student on iPad finished task assigned.
- Students looked up a word in an online dictionary on the iPad. Students copied the word to the sentence, finishing the task correctly.
- Student finishing task assigned, with help from partners.
- Teacher monitoring work, says "good" to one pair of students.
- Students mixing L1, L2, but on task
- 1 student on task, other waiting.
- Student responding to question in L2
- Students finishing task, working cooperatively.
- Student finishing task, L1 use by partner.
- Students finishing tasks, asking teacher for help in L2
- Fighting over who would use iPad inhibited learning temporarily
- Keyboard operation inhibited continuing with task

Unanticipated problems

- Students couldn't initially find the 'return' key
- Noise level
- Students fought over iPad. Student used plastic marker as stylus. Teacher corrected.
- Keyboard navigation problems
Appendix 5D: Observation notes from Grade 2 Cohort A – Non-iPad Lesson – Day 2

Lesson Description: Students write out on A3 paper ways to use recyclable materials.

Research aim: to see if this would lead to any insights on the difference between a classroom with iPads and a classroom without, asking the question, “Are students any more or less engaged in the lesson not using iPads as opposed to using them?”

Student engagement
- Markers, pens, pencils. All these are also "kinaesthetic". If you argue that touch-based mobile learning devices are "kinaesthetic", well, so are pencil and paper! Seems to be the same or maybe even better cognitive engagement because the paper is there, it's also mobile, it's also thin, it's right there.
- Doesn't inhibit face to face.
- Students were drawing on an A3 paper simultaneously. This was an affordance of the paper that the iPad didn’t have.

Other observations
- Teacher thought the paper results were more effective than the iPad results of the Notepad exercise from Day 1. BUT Teacher talked about how if there was an iPad at each table with a Google translate feature on, that would be an affordance for that table in terms of allowing them to translate things without teacher help.
- So iPad can be used alongside paperwork that would be an affordance to supplement written work. So if iPad was normalized (Bax, 2003), and was available at each table, it would facilitate language learning, achieving learning outcomes.
- "It's almost as if we are bringing the internet to the table in a very inconspicuous way" – Researcher to in-class teacher.
- An iPad could even be mounted into the table as a permanent feature - the internet as furniture!
Appendix 5E: Observation notes from Grade 2 Cohort B – 2nd iPad Lesson – Day 2

**Lesson objectives:** Students use iPads to go to Enkablogs website, access Recycling unit related materials

**Research aims and Obs. notes:**
- Explore effectiveness of iPad implementation of WordPress websites customized to curriculum goals and unit of study
  - This was easy to navigate, especially when an icon for the Enkablogs WordPress website was added to the main menu (another iPad affordance), allowing students to easily click on that icon to bring them to that link, rather than typing out the link.
- Observe student use of WordPress blog in terms of ease of use and navigation
  - It was easy to scroll down the Enkablogs entries and click on appropriate pictures or embedded videos that led to other sites or videos
    However the site wasn’t very complex and didn’t have lots of content – only enough for the particular lessons of the week. If there was more content it would have been less easy to navigate possibly.
- Observe effectiveness of multimedia capabilities of iPad, including YouTube and Google Docs forms
  - Google Docs forms worked well – students were able to finish tasks.
  - YouTube issue is the sound of the iPad speakers – they had the potential to be too low in some instances with a lot of classroom noise, for students to hear, or too loud, causing other students to be disturbed.
- Observe HotPotatoes JavaScript integration in WordPress on iPad
  - HotPotatoes worked but had to be troubleshooted beforehand. Some features of HotPotatoes and the underlying JavaScript don’t work with iPad unfortunately, so by trial and error you can determine which aspects of the HotPotatoes platform work on iPads – a bit of a clumsy and time consuming thing. So the iPad needs more JavaScript flexibility.

**Observations on student engagement with iPads**
- Enkablogs page seemed to take long to load, causing student to be inactive
- Students weren’t sure what to do. Researcher had to intervene.
- Page didn’t load quickly, students idle, unsure what to do
- Students were engaged, working on task.
- The pair working together seemed fine exchanging the iPad.
- Students enjoyed sharing their iPad screen views with each other (similar to showing each other their paperwork). They seemed proud of this.
- Two kids working at one iPad were negotiating.
- Students needed assistance with saving the images on Blackboard.
- Navigation was easy with icons.
- Affordance: menu page with selected icons for students, anchor activities, extra activities, make it very easy to navigate, direct students to move to extra activities, thereby staying on task, not disturbing other students, etc. I.e. the process of going from main activity to early finisher activities was very smooth. Students stayed on task for duration of 12 minute video.
- Student using HotPotatoes was engaged until she completed activity.
- Easy navigation allowed one student to easily navigate back to a related activity.
- Richness of extra related activities keeps students engaged/on task.

**Observations about Ss achieving learning outcomes with iPads.**
- Long load time caused student to be inactive
- Students not independently able to start task
- Task couldn’t continue due to slow page load
- Students finished task, used L2 to find out what to do next, moved on to early finisher/extra activities.
- Students did read-along topic related storybook, slightly above their level but they were interested so they stay involved / engaged.
- Argument for 1:1 - one student inevitably is less active, has less contact with learning opportunities.

**Unexpected problems**
- Page didn’t load quickly
- Unclear instructions
- Page didn’t load, technical difficulty. Affordance of WordPress is that it can be fixed during lesson, and all you have to do is reload the page to get it working again.
- Speakers for individual iPads were too low.
- PW students had to bend over, put their ear against iPad to listen.
- Earphones? Double earphones for PW? Certainly iPad allows this affordance.
- Fighting over iPad needs consequences / rules.
Appendix 5F: Observation notes from Grade 5 Cohort B – 1st iPad Lesson – Day 2

Lesson objectives: Students do reading comprehension quiz on iPads in relation to their levelled reading books

Observations on student engagement with iPads

- Maybe there needs to be a policy, a way where students can pick up their iPads, with instructions on a poster or something to immediately start working independently.
- Students would get a sense of independence and self-motivation.
- (Instead, in this video, researcher brought iPads to table, instructed students what to do).
- Students still need 1:1 assistance with some of the features (navigation) of iPad.
- T needs to take this into consideration.
- But the more these devices are used, the more students will get used to them, develop their skills.
- This task involved two special needs/low students who were normally not easily engaged in activities.
- At least one of the them the teacher referred to in a post-lesson interview as being normally disengaged and had behavioural problems.
- This student appeared engaged and on-task 95% of the time.
- However this may have been helped by the fact that the researcher was there to help students, and frequently intervened to help (in the role of a technology assistant, assistant teacher).
- Only one instance of disengagement/idle time during a 20 minute single activity period!
- Same as above, except with Language Arts, higher level students.
- All remained on task for duration of 18 minute lesson.
- All finished task at hand.
- Affordance of iPad: Student can bring work on iPad directly to teacher to get assistance, as opposed to Netbook or laptop tied to cable/cord.
- Noise level very low in classroom. Google translate used as an affordance on the iPad (easily accessible, can switch between programs) to enable them to stay on task and not bother teacher, who may be working with other students.
- Teacher reflected that the students were acting autonomously, an educational goal at Enka, but also noted these were high level, very capable/smart students who could 'figure out' the iPad.
- Students were able to full complete task on time.
- This activity - a series of 9 detailed questions requiring typed answers - kept the students engaged.
- Teacher casually talked to students, asked if he'd like all classes like this, student said "yes" and "yes to enjoying the activity".
- All students liked the activity. i.e. evidence of behaviourally (all on task, sitting at tables doing work for 20 min), cognitively (completed work correctly, evidence from Google Docs results), emotionally engaged (response to question, "did you like it" was an enthusiastic "Yes").

Observations about Ss achieving learning outcomes with iPads.

- Working with an iPad and a book (i.e. Using iPads to answer questions from book in form of questionnaire) really seemed to work.
- In this class what was great was that the students who had iPads were doing quiet 1:1 work which the teacher needed in order to work with the other half of the class, which was a L2 speaking activity.
- Teacher got to do more personal work with less students. A lot of L2 was heard in the background.
- Can't underestimate the value of having half the class on iPads engaged, allowing teacher to meet specific needs of students in a smaller group. This totally helped learning outcomes of the whole class, i.e.
- L2 speaking practice, reading comprehension/discussion, reading practice, these were the goals of the lesson. Also vocab enhancement ("gannet"). Teacher had time to deal with this.
- Looking at results of questionnaire (for Aliens), maybe students needed instant feedback in order to fix their answers. Some didn’t answer correctly.
- But Google Docs enables teacher to review answers and discuss as a class on screen - an affordance that the teacher didn't happen to use this time.
- See Appendix 6 for Questions to Aliens for Breakfast Google Docs answers sheet
- All finished reading comprehension task, stayed consistently focused to do so.
- See Appendix 6 for answers to Kensuke’s Kingdom reading comprehension questions.
- See observation notes for individual answers.

Unanticipated problems

- Forgot to include section for "Write your name" on online form
- Battery finished on one device, student lost his work, had to restart.
- In another instance, a student got up to go get a dictionary to help with a question.
- Not knowing the affordance of double clicking on menu button to go access Safari web browser to get dictionary, then go back.
- Maybe I needed the dictionary.com app, and had to explain it to them in the beginning of class.
Appendix 5G: Observation notes from Grade 2 Cohort A – 1st iPad Lesson – Day 3

Lesson objectives: Students use iPads to go to Enkablogs website, access Recycling unit related materials

Observations on student engagement with iPads

• Students working cooperatively, on task.
• Students were mostly engaged, but appeared distracted watching video, or video wasn’t engaging enough.
• 1 student wasn’t actively trying to share the iPad with other student, other student appeared less engaged.
• T needed to assist for them to move to next activity.
• Once they were on the activity, participation started working for both students.
• T deciding to bring Ss back to carpet, give instructions, send back to iPads, helped students know what to do, get on task.
• Both students engaged with reading activity, students flowed easily from reading activity to watching a video.
• S1 new that flipping iPad to landscape got the movie to appear big.
• S1 turned iPad to face both students (proper PW behaviour).
• Interactivity enabled by WP blog, embedded video in reading ex. helped engagement
• iPad portability enabled a switch from flat on table for reading to hold in your hand to watch video.
• Students could both hear speakers/video.
• Interest was sustained over 2 minute video.
• Navigation back to original WP page was easily managed.
• Students seemed to need more help during later transitions.
• At one point S1 got up with the iPad to bring it to the teacher to ask for next instructions.
• Students generally stayed on task, showed proper collaborative work.
• Students were able to stay engaged while taking turns reading from a text on iPad.
• Students needed T assistance with HotPotatoes sequencing activity.
• Students could navigate HotPotatoes sequencing, some assistance from T

Observations about Ss achieving learning outcomes with iPads:

• On task, pairs trying to complete task, asking for clarification in L2
• Word/picture association worked well for interactive HotPotatoes activity.
• Both students at 2:1 iPad were taking turns reading the text from the story without teacher assistance. Instances of disengagement, uninvolved.
• Blackboard led to a lot of L1 discussion, could have been in L2.
• Blackboard did not facilitate language learning.
• Teacher involvement, careful instruction, insistence on use of L2, still crucial.
• Blackboard still achieved goals for PYP unit based goals in that they were doing something related to recycling.
• Both students taking turns reading text from iPad in English.
• Sequencing was doable and achieved learning goal.
• Both students engaged doing sequencing activity, targeted learning activity/goal

Unanticipated problems

• Students didn’t open full screen view in YouTube app, video was smaller (I thought they would figure this out)
Appendix 5H: Observation notes from Grade 5 Cohort B – 2nd iPad Lesson – Day 3

**Lesson objectives:** Students use iPads to research production of chocolate, how chocolate is made. They take notes on paper or Notepad app, then transfer research to Keynote presentation app on iPads to make presentation about how chocolate is made.

**Research aims / questions:**
- Observe students’ interaction with iPads. Can they navigate?
  - Most could do this fairly intuitively but not all knew about the affordance of double clicking on the menu button – those who used this were able to navigate more quickly, but only 3 out of the whole class seemed to know this (i.e. most need to be taught some iPad affordances)
  - The same goes for resizing photos, taping and copy pasting items – most of these navigational tricks need to be taught.
- How much does the lack of flash capabilities on the iPad impede lesson objectives?
  - Lack of flash was only an impediment in not letting students go the brainpop site – and also watching certain YouTube videos. Otherwise we were able to get around this disadvantage.
- How easy is Keynote to work with in terms of students preparing presentations?
  - Fairly good but as noted the opening screen sample KeyNote instructions page was confusing. There were too many options, the ones observed working on the Keynote seemed frustrated. More notes in observation notes below.
- How easy is it for students to note take on iPads?
  - Those who did this knew how to double-click on menu to navigate between apps.

**Observations on student engagement with iPads**
- Did the camera close up cause students to be more engaged, because they knew they were being watched? Invasive aspect of filming classrooms.
- Would have been cool to have a recording of screen usage, is there an app for that? (Apparently there is not, not officially, iPads need to be jail broken first).
- Students needed help with some navigation. Basic course in iPad usage?
- Some things not as intuitive (i.e. double click menu button).
- Students got distracted by presence of camera close up. 1 student needed to ask T a question, got up with iPad (not approved by T because iPad could break) but left other student (non-iPad student) inactive.
- 1:1 would have solved this.
- Non-iPad student has potential to be idle, disengaged cognitively (even though behaviourally they 'look' as if they are engaged', but in this example, the student wasn't taking notes, wasn’t reading. The other student was doing the cognitively heavy stuff.
- Students engaged, on task at table. 1:1 helps with this of course.
- Really helped that all navigation for each iPad was the same - enabled teacher to assist all students, didn't have to 'learn' a different setup for each iPad. Low student taking notes, doing activity, engaged cognitively, completing task. 1:1 much more cognitively engaged as opposed to previous video above.
- In terms of independence, it looked like Ss needed more assistance than originally thought. Both teacher and researcher were helping students 1:1. But once Ss get more used to iPad this could decrease.
- One student eventually appeared to be either fatigued or bored after 15 minutes at iPad (leaning on her chair, not engaged appearing not to be engaged with task.
- Either she got bored or cognitively it was too challenging, above her level?
- Teacher assistance should have corrected this.

**Observations about Ss achieving learning outcomes with iPads.**
- Student was taking notes from YouTube/online video related to topic of chocolate production.
- Student was able to pause video, take notes, and continue.
- 1:1 iPad usage would have helped both students learn more, or be cognitively more engaged in activity.
- This activity took way too long, especially for pair work. Very little L2 occurred, wasn’t planned well.
- There could have been clearer instructions, a brief summary of how to get bullet points out of a long paragraph, etc.
- Move them on to creating their PowerPoint.
- Have discussions be in L2.
- They should have finished this by end of period.
- Choosing the right website that has info that is summarizable to their level is crucial (good teacher practice with tech).
- Argument for this is that teacher planned this, i.e. she wanted students to take notes for one period, then do presentations in next.
- T directed students to search for more resources on Google, but is this the best way?
- More thought needs to be put into directing students to specific sites that are educationally appropriate.
- Ss asked "can we copy paste in this?" - There needs to be standards for plagiarism set by the teacher.
Appendix 5H: Observation notes for Grade 5 – 2nd iPad Lesson – Day 3 (cont.)

Observations about Ss achieving learning outcomes with iPads (cont.)
- Obviously a student can’t just lift something directly from a website into their presentation - that doesn’t serve the language purposes.
- So this is an anti-affordance of technology? If student meant copy paste picture obviously this was allowed and part of activity, to prepare presentation with pics.
- If this activity was done using pen and paper and a book about chocolate.
- Wouldn’t it have been the same, in terms of results?
- I should have done a control group for this.
- The good thing about iPads is that videos, the whole internet is at their fingertips.
- The power of the internet in terms of content.
- The iPad is a content deliverer enabling students to access the world easily and in a user-friendly way.

Unanticipated problems
- iPad can be loud enough to disturb other students. Lack of 1:1 creates engagement problems, low cognitive engagement.
- More challenging tasks in higher levels must be done 1:1 (recommendations).
- Eventually Ss changed roles and switched who was writing.
- Students, when sent to a website, didn’t know how to distil the information - spent too much time on one site (chocolate related information) and weren’t writing the bullet points, or summary very easily, i.e. they took too long to come up with a summary of how to make chocolate.
- One student exhibited behavioural engagement (she was at the table, not causing trouble, but didn’t appear cognitively engaged with the activity.
- She needed something else? But teacher didn’t either see this or felt that it was appropriate what she was doing.

Actions
- We’ve got to implement 1:1 activities.
- It’s much better with low iPad number to have half the class work on iPad and the other on something else.
- Better than 2:1.
- Even with students 1:1 - Ss need to be monitored by teachers
- Slower students need extra help, more kinaesthetic activities perhaps, rather than 15-20 minutes doing a writing activity at the iPad.
Appendix 51: Observation notes for Grade 5 – 3rd iPad Lesson – Day

**Lesson objectives:** Students use iPads to research production of chocolate, how chocolate is made. They take notes on paper or Notepad app, then transfer research to Keynote presentation app on iPads to make presentation about how chocolate is made.

**Observations on student engagement with iPads**

- This is again the same situation as previous students on same day, 2 kids per 1 iPad.
- So cognitive engagement in kid who wasn’t as involved at the iPad was low.
- However, this time the 2nd student was more engaged in that he was trying to help the girl who was on the iPad with spelling (though using L1).
- So he was involved, so there was more teamwork here than in other example above (Grade 5 iPad lesson 2 Day 3).
- Affordance: Ss in this example were able to simultaneously take notes and bounce back to the website/information they were viewing about chocolate.
- Efficient and totally student-accessible, i.e. students were able to figure out this affordance.
- There was much more engagement between the two students, as both wanted to participate actively.
- Therefore, it’s not that the 2:1 ratio that prevents full cognitive engagement from both students, it’s more related to the attitude of each student, even though for those students who don’t have interactive/reational skills (argumentative, etc.) it’s harder for them, and those students should use iPads 1:1 to be more cognitively engaged.
- However (further disclaimer), after a period of about 9 minutes of mainly one student using the iPad, even in this case the second student appeared disengaged or bored.
- At best he went from periods of boredom/disengagement to involvement/engagement with partner in activity.
- After watching the whole video, I’d say he was engaged 65–70% of the time, either helping the girl or actively participating, suggesting, etc.
- Touch based affordances: it wasn’t that touch-based was so easy and intuitive that Ss had no problems at all.
- In this video the S appeared frustrated with some navigational/touch-based features.
- But the engagement was sustained throughout. Probably more enjoyable/kinaesthetic than mouse/keyboard.
- Same issue of one Keynote presentation being created by two students.
- Didn’t work, in the sense that 2nd student wasn’t involved as much as he should have been.
- Affordance: Being able to send Keynote to computer as PowerPoint.
- Using Keynote, S was able to be fairly independent and fully engaged.
- But when she hit a problem, researcher needed to intervene to show her how to do something on Keynote.
- Affordance: access to the internet and copy pasting from internet to keynote was very easy, engaging for this S.
- All done by 5th grade student without assistance.
- This is why engagement is happening!
- Another affordance: little fingers on little kids are good for clicking on small things on the iPad.

**Observations about Ss achieving learning outcomes with iPads**

- Task itself was completed, but only one student was really doing the research, in the sense that it was she who copied it down, typed it in, so only one student reaped the benefits of the activity, language and learning outcome-wise.
- This whole exercise seems to have been basically about copying down information from the internet and pasting it into a PowerPoint/Keynote.
- Maybe only 2 of the 5 groups did it right in that they used their own words instead of copy pasting.
- See student results in Appendix 6 for KeyNote Presentations.
- All students in this activity did an excellent job preparing the PowerPoint’s (KeyNote presentations).
- Some grammatical errors, could be corrected. Other reflections: The question is, if this takes so much teacher assistance, is this pedagogically useful? Does this really meet the goals - Answer: providing they are doing topic/unit/reading related things, teacher assistance should be a given, that’s what they’re there for.
Appendix 5I: Observation notes for Grade 5 – 3rd iPad Lesson – Day (cont.)

Unanticipated problems

- Keynote starts with a demonstration slide show that confuses the students. Student at one point got frustrated with iPad/Keynote feature.
- S seemed relieved when she was able to paste something in (i.e. it wasn't as intuitive as one would think, still took trial and error.
- Some training would have been good). Issue of plagiarism came up again, teacher had to intervene and say "I told you I want you to write your own sentences, and not copy paste".
- Temptation just to copy paste from internet is very strong, now that affordance is there (negative affordance).
- Student put too much information on one slide.
- This activity need to be more guided.

Actions

- 1:1 is still the way to go, even with two students who are otherwise active participants, good students, etc.
- The iPad affordance of an HDMI plugin cable should have been used to show students how to copy paste, etc. Would have avoided some frustrations.
- Another suggestion: Teacher needed to have understood the nature of the iPad and Keynote in the sense that it could be a note taker too.
- I.e. They could have researched what they needed to have researched on the internet and gone back to Keynote to type in what they learned, rather than the intermediary stage which took 1 whole lesson, of copying notes onto paper or Notepad.
- This activity would have been much more efficient if everyone was 1:1, if we streamlined to just research directly to Keynote, and if there was training at the beginning, then bullet points, your own words, now plagiarism enforced.
- Teach students basics about iPad affordances, i.e. double clicking menu button, copy/pasting pictures from internet, etc.
Appendix 5J: Observation notes for Grade 5 – 4th iPad Lesson – Day 4

Lesson objectives: Students use Popplet app to write a story diagram of the events in a chapter of their levelled reading books.

Research aims / questions:
- How well is the Popplet mind mapping application suited for summarizing chapters in stories?
  - The current options on the free app were sufficient to finishing the task, however, some of the buttons and features are very hard to click on and access unless you zoom in on them by moving two fingers in an outward motion on the screen, a feature/affordance some students didn’t know about. So some of the navigation/interactivity was too delicate for primary students – some got frustrated, although most were still able to finish activity and do drawings (see Appendix for student work).

Observations on student engagement with iPads
- These are the same two students as in Grade 5 iPad Lesson 2 Day 3, except both students now have iPads. Both are obviously cognitively and behaviourally engaged.
- Student needed direct help from researcher/teacher in terms of copy pasting photos into Popplet.
- Student still managed to do drawing and copy paste picture from internet, plus write sentences (even though sentences weren’t accurate, but that’s expected).
- This task sufficiently engaged student cognitively/behaviourally: student was doing task, following instructions, engaging in activity.
- Affordances: - rather disaffordances: some of the buttons on the Popplet were too small for the students’ own fingers
- Student was using two fingers to type quicker
- In a sense this was really an art project in that the student needed to design a framework/set of boxes, then draw pictures. The text/sentences were almost secondary.
- Shouldn’t I have found an app that made the focus of the language most important. I.e. An app that lets you record your voice, then write the text.
- Something of a storyline, a comic strip, something more creative?
- Affordances: Student was able to apple double-click menu button to Popplet as well.
- This was still a good activity in that you got almost 95-100% engagement in terms of the student constantly using the iPad for the task.
- In this case you even got L2 casual interaction about the task, another language target.

Observations about Ss achieving learning outcomes with iPads
- Both students engaged, completing tasks. Language-wise was it significant?
- They had to summarize the stories.
- Student A was totally on task, did task, drew his own pictures, finished task.
- Could have had better language, but he did his best and consulted the book.
- Student was consulting book for sentences, so he was on task with the learning outcomes.
- He was able to finish properly.
- Student was able to complete task, use book to write sentences, wrote their own sentences, and fulfilled learning outcome goals.

Unanticipated problems
- This app (Popplet) may have been too clumsy to merit serving as a learning application, in that it took too much of the Ss time to actually do the activity, this took them away from language learning.
- However the engaging aspect of the interactivity may have led students to actually enjoy the activity and therefore acquire language amelioratively
- Some of the buttons were too small for student to actually activate.
- When this is the case, the activity breaks down. But is that the fun of it?
- Some sentences/words/spellings were not correct.
- Shouldn’t there be a way to correct these.
- Taking a snapshot of finished work freezes the text and you can’t edit it.

Actions
- There’s an issue of interoperability, or similar features working the same way across apps and the iPad iOS.
- Popplet for example didn’t deal with pictures the same way as Keynote.
- Therefore Ss had to ‘learn’ how to do it differently for each app, which is time consuming, but are digital natives prepared for this?
- Student really needs to be aware of all the abilities of the software at the outset.
- But is it supposed to be intuitive?
- ACTION: CHOICE OF APPS IS CRUCIAL.
- You’ve got to select apps that draw out the language, if you’re doing ESL.
- Apps should be selected that allow future ‘editing’ for error correction.
Appendix 5K: Observation notes for Grade 2 Cohort A – 2nd iPad Lesson – Day 4

Lesson objectives: Students use iPads with the Popplet app and do a sequential story diagram of the events that took place, i.e. first, then, last. Students write sentences for each section of the story, and draw or copy paste illustrations to illustrate that part of the story.

Answers to Research aims:

- How does the Grade 2 students’ use of this app compare to that of the Grade 5 students? Any differences?
  - Both grade levels were able to complete this activity and produce relatively good work. The disadvantage of this app not having automatic or suggestive spelling correction was unfortunate, in that it could have aided students to find correct spellings, causing learning opportunities.
  - The Grade 5 students were more willing and capable to use the drawing feature of Popplet to produce better results, showing that Grade 2 students still need to learn a lot of multi-touch skills which should be taught rather than assumed.

- How much does this activity facilitate discussion in L2?
  - Not a lot unfortunately, mostly an individual, non-oral activity, but the reading of it to the class or teacher could allow this.

- Is this more practical / feasible / effective than the same activity with paper and pencil?
  - You could almost argue either way. The interactivity of this app kept students engaged, definitely. But the frustration over not being able to operate some features, and the slowness in being able to correct spelling mistakes, etc., caused the teacher to think paper and pencil was just as worth it if not more so, i.e. more practical.

- How much teacher assistance is needed for this activity? - A fair amount, more than expected.

- Did students enjoy it, i.e. were they engaged with the activity? To what extent? – Yes they were, very much, to the point of finishing the activity satisfactorily.

Observations on student engagement with iPads:

- All 3 students working individually were engaged, on task.
- Needed frequent T assistance.
- All student interaction was in L1, switched to L2 when teacher came along.
- They didn’t seem enamoured by the advice, more like they were feeling productive.
- So maybe not the novelty as much as the functionality, or usefulness.
- One instance where student ‘skipped’ to teacher to ask a question (translation of L1 word to L2), then ‘skipped’ back, i.e. he was excited to get back to his work.
- General attitude among these three students were engaged and happy to be doing this activity.
- Popplet was engaging enough to sustain interest.
- Paper is portable too, student was engaged in paper activity
- Student completing activity, getting help from teacher in L2, had finished activity so was engaged throughout.
- Popplet was engaging enough to sustain interest.
- iPad affords an economy of space - you don't need pencils, marks, pencil cases, etc.
- No large format papers, only iPad, size of Letter sized paper or less.
- Students doing task, but collaborating in L1.
- Would 1:1 reduce all that L1? Previous video showed 3 kids working 1:1 with a lot of L1.
- Later in this video, a 5th student came by, was interested in the other students’ activity, sustained interest watching them use iPad app.
- iPads definitely sustaining interest (in this case, Alphabet app), but still a lot of L1, unique to this class? Grade level?
- Student easily turned up volume.
- Not instructed. Students didn’t want to leave iPads, said "one minute".

Observations about Ss achieving learning outcomes with iPads.

- Students needed to be monitored to produce full sentence.
- Students stayed on task, completed activity. However, a lot of L1 in S-S interactions, though on-task, task related L1.
- Popplet could have had too many features to distract from the actual language aspect of exercise (writing a sentence about each stage in the story).
- Student able to complete paper activity and achieve learning goals.
- Is the iPad more interactive, dynamic?
  - Obviously yes, but I wonder what the cognitive differences between using an iPad and using paper for same activity.
- Student completed sentences with teacher assistance, spelling and wording assistance.
- Seems to be the same, only maybe cognitively the writing of a sentence physically by hand helps retain spelling in memory?
- Students were doing the Starfall Alphabet app, practicing initial consonants and vowels, help with reading skills.
- Class noise level is definitely significant, but could relate to teacher practice.

Unanticipated problems:

- One instance of a girl bothering the other girl, touching her iPad when other student didn’t want her to do that.
- One instance of 1 student "messing up" her own work on Popplet app.
- Would this happen on paper and pencil activity?
- Instance of one girl pushing another girl’s arm away from iPad.
Appendix 5L: Observation notes for Grade 2 Cohort B – 3rd iPad Lesson – Day 4

Lesson objectives: Students use iPads with the Popplet app and do a sequential story diagram of the events that took place, i.e. first, then, last. Students write sentences for each section of the story, and draw or copy paste illustrations to illustrate that part of the story.

Observations on student engagement with iPads
- There need to be specific instructions for how to sit in pairs with an iPad (direction needed from teacher).
- Pair work works great when one kid is looking at the book, the other is on the iPad typing. 2 roles, 2 devices.
- This was an 18 minute single shot of 2 students working on 1 iPad.
- iPad wasn’t so much an anomaly/novelty that the student who wasn’t using the iPad but assisted went ‘crazy’ impatiently wanting to use it.
- They tended to wait patiently until their turn.
- The non-novelty of it actually helped engagement in that respect. Students got off task in brief intervals but went back to task independently. Popplet took too long to finish. Should have been done 1:1. Simpler set of instructions? Students were excited to finish.
- The off-task behaviour didn’t lead to Ss stopping to do the activity, they still finished their task. Certainly no non-lesson games should be available to students for early-finishing; they will tend to use them.
- There is also the problem of students trying to download apps (which they can’t) or going to main menu and clicking on the standard default ‘games’ icon which cannot be removed.
- Late in the day could explain students ‘acting up’, getting distracted.
- These two kids, despite some mild off-task behaviour, were using the iPad more than 90% of the time.
- L1 was almost 95% used.
- At the end, 18:00, students were fighting over iPad, even best students were off task.

Observations about Ss achieving learning outcomes with iPads.
- Reading book and using iPad obviously works smoothly.
- Students engaged in collaborative activity at iPad, fulfilling learning goals.
- Students helped each other with English which seemed to lead to both students benefiting.
- Popplet was sufficiently engaging to make students finish task. Visually it was manageable, accessible.
- Students pronouncing L2 spelling with L1 phonology.
- Problem of L1 usage during activities, or lack of L2 during collaboration, is still a problem.
- ESL best practices still need to be in place to ensure L2 is used.
- Were these students being entertained or were they learning with the Starfall app at 15:38.
- This was also the end of the class, late in the day.

Unanticipated problems
- Students talking into camera was a distraction, i.e. Camera was invasive.
Appendix 6 - Student work

6A: Google Docs Spreadsheet results

1. Grade 2 Recycling Unit Jimmy the Jar Exercise (Day 2)

<table>
<thead>
<tr>
<th>Timestamp</th>
<th>What do you think will happen to Jimmy?</th>
<th>Write your name here:</th>
<th>Observations:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/26/2011 23:09:41</td>
<td>Maybe they could make him new</td>
<td>Students 1 &amp; 2</td>
<td>Correct sentence</td>
</tr>
<tr>
<td>4/26/2011 23:09:59</td>
<td>He will be a new jar.</td>
<td>Students 3 &amp; 4</td>
<td>Correct sentence</td>
</tr>
<tr>
<td>4/26/2011 23:11:35</td>
<td>Jimmy heva bean go to the recycle factory.he will Go to it.I thing he will like it.</td>
<td>Student 7</td>
<td>Spelling, grammar, punctuation errors. Could be corrected in whole class activity viewing Google Docs answers</td>
</tr>
</tbody>
</table>

2. Grade 5 Reading Unit Answers to Reading Comprehension Quizzes

a) Language Development Unit Reading Comprehension Quiz answers:

<table>
<thead>
<tr>
<th>Time stamp</th>
<th>Why didn't Richard like his sneakers?</th>
<th>Who is Aric?</th>
<th>What's Aric's mission, goal or job?</th>
<th>Who are the Dranes?</th>
<th>What is the problem Aric has on page 12?</th>
<th>Where did Richard and Aric go at the end of the chapter?</th>
<th>Observations:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/26/2011 01:41:23</td>
<td>Because Dorf buy new one and Dorf didn't were sneakers.</td>
<td>Aric is alien</td>
<td>Aric's mission job is killed every drane's...</td>
<td>Drane's are space trash.</td>
<td>Aric problem is they don't have any weapon...</td>
<td>Aric and Richard goes at school...</td>
<td>Good long answers, needed assistance with spelling, sentence formation. Could be done in Whole class Google Docs results session?</td>
</tr>
<tr>
<td>4/26/2011 01:41:28</td>
<td>Bikous Dorf didn't Wer sneakers</td>
<td>Aric is alien</td>
<td>Spes worn</td>
<td>Drof</td>
<td>He lost wepen</td>
<td>School</td>
<td>Spelling wrong. Needed assistance feedback/correction</td>
</tr>
<tr>
<td>4/26/2011 01:42:30</td>
<td>Because sneakers are not Fashion</td>
<td>Aric is a alien</td>
<td>His job is to Destroy the dorf.</td>
<td>They have yellow hair and bulu eyes!</td>
<td>He forget the darners name.</td>
<td>With bus.</td>
<td>Spelling wrong. Needed assistance/feedback/correction</td>
</tr>
<tr>
<td>4/26/2011 01:42:41</td>
<td>Because it's no fashion</td>
<td>Aric is a alien</td>
<td>Aric s job is alien.</td>
<td>New person</td>
<td>It's a aliens.</td>
<td>Go to the school.</td>
<td>Didn't get answers right. Needed assistance, feedback?</td>
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<td>Column C</td>
<td>Column D</td>
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<td>Column G</td>
<td>Column H</td>
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**Language Arts Reading Comprehension Quiz Answers**

- **Observations:**

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<th>Response</th>
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<td>What was the main idea of the story?</td>
<td>The main idea of the story is...</td>
</tr>
<tr>
<td>What was the author's purpose in writing this story?</td>
<td>The author's purpose is...</td>
</tr>
<tr>
<td>Character A</td>
<td>Character B</td>
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<td>Details 2</td>
</tr>
<tr>
<td>October 1</td>
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<td>Details 5</td>
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<td>December 1</td>
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<td>Event 8</td>
<td>Details 8</td>
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<tr>
<td>February 1</td>
<td>Event 9</td>
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<td>April 1</td>
<td>Event 12</td>
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Appendix 6B: Samples of Popplet Reading Summary Exercise from Day 4

1. Grade 2 Example

   ![Grade 2 Example Diagram]

2. Grade 5 Example

   ![Grade 5 Example Diagram]
Appendix 6C: Sample of Keynote presentations from Grade 5 Day 3

What can we do with chocolate?

- Many people love chocolate they make lots and lots of kinds of desserts with them as
- Ice creams
- Some drinks they make
- Biscuits with chocolate
- They make delicious pancakes with the chocolates
- They make cakes and birthday cakes.

How is chocolate made?

- Chocolate is made from the topical bean of the cacao trees the beans are collected. From the rain forests trees. There is topical trees ponds grow the beans.
Appendix 6D: Sample of Grade 2 Blackboard Activities – Recycling Unit
Appendix 7 - Researcher journal excerpts

Appendix 7A: Researcher Journal - Day 1 of Research project, April 25, 2011

Notes from interviewing Cohort B Oylum’s 5th Grade Class:
- One student had an amazing ability to use the iPad - skills are obviously there.
- Interviewed 7 in one class
- No PowerPoint in iPad
- A lot of students are quoting that they’d basically use it for internet
- [One student suggested they could use the iPad to] load photos and music on to it.
- Student thought it was the same as a computer to type on iPad.
- Final reflections:
  - Most kids had iPads
  - They had ideas about how to put them to use
  - They were comfortable about the technology
  - They expressed interest in using them in the classroom
  - Generally they had a positive feel about using them to learn English

From Interviewing Grade 2 Students:
- I need to change these questions
- Something like, do you think technology would make a difference
- One student said “Electronic devices can waste your time”
- Lots of the kids have iPads at home.

Final reflections for Grade 2 1st iPad Lesson Day 1:
- Kids were engaged, on task, seemed to like working with them, even though they were doing a simple notepad project
- Kids were able to work in groups
- There was an ease of use involved with the iPad - i.e. two or more kids were able to use it.
- Typing on it didn’t seem to present a challenge
- Kids were able to “figure out” how to do things
- It was fairly intuitive for Grade 2 kids
- They were relatively engaged and had fun.
- It saved paper
- Kids were engaged

Appendix 7B: Researcher Journal - Day 2 of Research project, April 26, 2011

Thoughts on using iPads in the classroom:

The lesson that I taped with the kids doing the paperwork instead of the iPad similar activity - seemed to be just as effective. Kids were engaged, they were at the table. But we discovered a salient use of the iPad even in this situation. The teacher said, “If there were an iPad at each table, then it could be set to a “Google Translate” app that the kids would use to type in a Turkish word and get a translation to help them with the work they were doing.” This, she reflected, could lead not only to increased learning on the part of the student, but less time having to track down the teacher, get out of their seat to get the teacher, and the teacher is freed up to help others. Basically the idea is having the internet inconspicuously available at each table, to help with paperwork.
Also it seemed that the teacher had an easier time reflecting with all the kids with the paperwork as opposed to the iPad similar activity. She was able to bring kids back to circle time and use the papers to reflect, providing more learning time.

Teacher reflection: “If the iPads were introduced at the beginning of the year and became inconspicuous and a normal part of the classroom, it would be less of a novelty and perhaps more effective in its usefulness in bringing information to the students in an easy and accessible way.”

Observations with Grade 1 students using ABC Starfall APP [not part of research project, done informally]

Reflections:
- Students, engaged, interacting, going over a lot of content. Allows teachers to focus on using L2 in casual interactions.

Reactions from students:
- “This is fun”
- Better than pencil, paper

Observations of Grade 2 Cohort B, 2nd iPad Lesson Day 1

Positive things:
- Teacher said kids were engaged, more than usual.
- The sound in the classroom, the level of noise, went down significantly.
- That is, students were engaged enough to quiet down, not get hyper, etc.
- T noticed that even the worst behaved kid was engaged throughout the whole lesson.
- Students did their work, i.e. finished task

Negative things:
- WordPress had bugs
- HotPotatoes had bugs
  - HotPotatoes links and game content had bugs
- Bugs prevented kids from moving on, caused class management problems

Suggestions:
- WordPress, HotPotatoes and Google docs needs to be simplified and easy to use for it to be effective with teachers

Observations of Grade 5 Cohort B, 1st iPad Lesson Day 1

Reading Unit iPad Lesson
- Working with LD lower level students
- They went to enkablogs.com
- Clicked on “5th Grade English”
- They went to http://20102011.enkablogs.com/eng5/
- They did the Google Docs Forms exercise for the book, basically reading comprehension questions for the book.
- Teacher and I agreed not to show results as they typed them (in any case, until they submit the form, they don’t see the results)
- It took a bit of teacher involvement from my part (as researcher) to get kids on task, showing that it’s not completely autonomous, independent work
- It was great to be able to send students to “Google Translate” or Turkish/English dictionaries, etc, online, as they did their Google docs spreadsheet forms.
Appendix 7C: Researcher Journal - Day 3 of Research project, April 27, 2011

Observation of Grade 5 Cohort B, 2nd and 3rd iPad Lessons

- Topic: Production Unit, research topic = How chocolate is made
- Enkablogs, grade 5 content
- Observations:
  - Students seem to be quite capable of researching with the iPad
  - Students figured out Keynote, it was fairly intuitive
  - Students were engaged, liked working on the machines,

Appendix 7D: Researcher Journal - Day 4 of Research project, April 28, 2011

Observation of Grade 5 Cohort B, 4th iPad Lessons – Day 4

- Keynote - was great, synced, sent it back to teacher, PowerPoint’s, etc.
- Popplet app - had some bugs, not practical, needed teacher assistance.
- Teachers must know their apps
- This needed more teacher assistance than I had thought
  - But the students were engaged
  - They liked what they were doing
  - They figured it out
  - The intuitive factor was there
- Popplet gave students choices:
  - Either to draw or copy/paste
  - Flexibility of software caters to different needs of the students
  - The more flexible the technology is, the more appealing it is to different learning style

Grade 2 Observation with Popplet, Reading

- Students got going on it very quickly
- They still need assistance with some things
- It doesn’t disqualify best practices
- It’s cool when the teacher is able to correct the students on the iPad for spelling mistakes
- Teacher had some frustration about text editing in Popplet but overall was glad that there was jpeg export

Suggestions from teacher of Grade 2:

- Apps need to be customized, catering to the teacher
- Apps need to be chosen with teacher in mind
- Apps need to be custom designed to achieve learning outcomes
## Appendix 8 - List of microdecisions

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Decisions and reflections</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/18/2011</td>
<td>iPads</td>
<td>No flash is a bummer, plus java applets not supported. This makes HotPotatoes not function properly with dragging.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Apps store is very limited.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Customization is very hard with no flash availability.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WordPress may be the answer, also sites.google.com. But apps are something netbooks don't have, but you have to pay for them!</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The synchronization process, especially with apps, and Onswipe icons, maybe be very advantageous in terms of setting up something you specifically want for the iPad/students. Because of the nature of apps, that you click on an icon to bring you to a specific game/subject/project/activity, it's better if the WordPress website has only really one thing in it, not a number of different activities.</td>
</tr>
<tr>
<td></td>
<td>Netbooks</td>
<td>Netbooks are almost more useful, more practical to purchase and integrate into the system than iPads by far. No syncing problems, access to flash, better keyboard, cheaper.</td>
</tr>
<tr>
<td></td>
<td>Possibilities</td>
<td>I seem to have 3-4 different possibilities:</td>
</tr>
<tr>
<td></td>
<td>for iPod</td>
<td>WordPress customized with a plugin for iPad.</td>
</tr>
<tr>
<td></td>
<td>activities</td>
<td>Sites.google.com. Wordpress seems better than Google sites because of flexibility of plugins for iPad compatibility. The iPad plugin looks pretty good. WordPress definitely gives you lots more flexibility in terms of customizing something, even for use with iPads [therefore I will go with creating a WordPress site for iPads] i.e. changing the .png of the &quot;play&quot; button for mp3s.</td>
</tr>
<tr>
<td>4/19/2011</td>
<td>TO DO List</td>
<td>Make enkagrade2.info website for Recycling. Important, design relevant activities.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For Grade 2: Download, buy apps related to this. Plan out the 4 lessons for Grade 2. Have enough activities for 4-6 lessons. Topic based, but some language based.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For Grade 5: Think of ways [for students] to do research, develop research skills. Design activities relevant to this. Find apps relevant. Design Webquest/ treasure hunt for this. Have Google forms and HotPotatoes style activities for instant feedback.</td>
</tr>
<tr>
<td>4/24/2011</td>
<td>iPad usage</td>
<td>Decide on whether to have homepage links to assessments or icons on iPad for assessment. Which is easier? Decide to do YouTube videos as starter. Students would watch videos to have an introduction to the topic, get their minds thinking.</td>
</tr>
<tr>
<td></td>
<td>Website for</td>
<td>Trying to figure out how to have icons on the iPad for navigation. It's too bad a website like dreezle.com can't work on iPad - java applet. Some YouTube videos don't work on the iPad! That's another impracticality for teachers - everything should &quot;just work&quot;. I should ask them questions in an interview to get more information: Have you used an iPad before? What do you think about using an iPad? How do you feel? Do you think using an iPad will help you in your education? Would you love English more if you used an iPad? For Grade 5. &quot;Break down research into useable skills“. [Students should know] how to find a YouTube video online.</td>
</tr>
<tr>
<td>April 25th</td>
<td>Data collection</td>
<td>I realized one of the questions in the pre-assessment was redundant.</td>
</tr>
<tr>
<td>Day 1</td>
<td>5th graders</td>
<td>I should have given more thought to the kinds of questions I asked the students. But in general good interviews.</td>
</tr>
<tr>
<td>Grade 2</td>
<td>Teacher changed the plans and decided she just wanted students to write out something, so this changed my plans.</td>
<td></td>
</tr>
</tbody>
</table>
### Appendix 8 - List of micro-decisions and reflections (cont.)

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Thoughts/Notes/Decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 2</td>
<td></td>
<td>I'm realizing that there is really a collaborative approach between content designer and teacher.</td>
</tr>
<tr>
<td>Grade 2</td>
<td></td>
<td>The teacher wants their own content they find to be incorporated into the technology.</td>
</tr>
<tr>
<td>April 26th</td>
<td>Grade 5</td>
<td>Decided to use enkablogs.com, Eng5 to post the links to the questionnaire for the student books.</td>
</tr>
<tr>
<td>Day 2</td>
<td>lesson</td>
<td>This gives students easy access</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Relatively easy to set up for a teacher.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>So all I did was type up the form in Google Docs, just as I would a normal word doc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Then I got the link, posted it on Enkablogs / WordPress.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Very simple, any 21st century teacher can do it.</td>
</tr>
<tr>
<td>April 26th</td>
<td>General</td>
<td>I wanted to have students search for YouTube videos related to the topic but the teacher vetoed that, saying the kids would get off task.</td>
</tr>
<tr>
<td>Day 2</td>
<td>comments</td>
<td>I decided to try a paper checklist next to the iPad to see if kids would be more on task, or if that combination would be effective.</td>
</tr>
<tr>
<td>Grade 2</td>
<td></td>
<td>I'm trying a combination of free apps, paid apps, home icons leading to websites, WordPress, HotPotatoes, Google docs.</td>
</tr>
<tr>
<td>Topic</td>
<td></td>
<td>What's great about WordPress is that you can adjust it even during class, if there is a missing link, etc.</td>
</tr>
<tr>
<td>lesson</td>
<td></td>
<td>Need to check the website for bugs before the lesson.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Don't make it too complicated, otherwise fixing is a problem (i.e. HotPotatoes games with links)</td>
</tr>
<tr>
<td>April 28th</td>
<td>Popplet</td>
<td>Decided to use Popplet for two classes.</td>
</tr>
<tr>
<td>Day 4</td>
<td></td>
<td>Explored uses of this app.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Decided to 'interfere' [intervene] with students as students needed some teacher support for this device, and I was trying to figure it out myself.</td>
</tr>
</tbody>
</table>