

**LANGUAGE LEARNING ACTIVITY PARADIGM**

*by*

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## **ABSTRACT**

In this study, I investigate the application of active learning approaches, with the help of CALL and MALL frameworks. These interactive learning solutions emphasize learner-created content, with the goal of improving the vocabulary development of grade 7 students. It is assumed that the use of computer and mobile technologies can increase the capacity for learning vocabulary. With a concept prototype, that demonstrates the translation of a textually based Language Arts lesson plan into a visual paradigm for active learning, I create a more porous and malleable language learning model for the Google Generation. My hypothesis is that this prototype will benefit the learning of Language Arts for 7th grade students. Such an instrument could ultimately provide students with the opportunity to engage in knowledge creation and sharing across formal and informal learning environments. The methodology used for this thesis essay begins with defining a problem by utilising both academic and qualitative studies. This is followed by the collecting of evidence from alternative learning approaches, which are defined by their various strengths and deficiencies through product analysis, case studies and theoretical grounds. The essay concludes with a proposed design and concept prototype testing, which I have called The Language Learning Activity Paradigm (LLAP).

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## DEFINITION OF TERMS

**CALL and MALL Frameworks** – Computer Assisted Language Learning and Mobile-Assisted Language Learning, that is – smart phones and computers. In this study CALL and MALL frameworks are used as communication, information gathering and production tools.

**Cultural Probe** – The cultural probe method is a type of tool kit used for the purpose of information gathering in an unobtrusive manner about people and their activities allowing them to self reflect. This method can be applied as inspiration in the design process.

**Google Generation** – The “Google Generation” is a phrase that refers to the generation of young people, born after 1993, who are growing up in a world where the Internet is fully established and integrated into our society on every level. It is also a generation that is immersed in videogaming and social networking activities. I will refer to this generation as GG.

**Intermediate School Students** – Students within the age group of 9 – 12 who are enrolled in grades 5 – 7.

**Language Arts Learning** – Refers to literacy learning. It provides instructions for knowledge and skill development in areas such as listening and speaking, reading, viewing and writing. Students learn to utilize a formal language appropriate for writing essays, developing the narrative language of stories and the figurative language of poetry. In addition they learn to navigate the advances in the technical language of instructions.

**Language Learning** – Refers to the process by which people understand, produce and use words to communicate. This capacity involves the use of, but not limited to, syntax, phonetics, and an extensive vocabulary.

**Language Learning Activity Paradigm (also referred to as LLAP)** – This refers to the digital and interactive language learning approach, which is the basis of this project, intended to be used by intermediate school students in North America for the active study of language arts. This should be understood as a learning environment as much as a specific product.

**Participatory Design** – Participatory Design is an approach that enables designers to define user needs and preferences by way of a facilitated group design session gaining user input early in the process. The results are design ideas that reflect user requirements.

## 1. PROJECT INTRODUCTION

Research suggests that in recent years there has been a marked rise in the use of Mobile-Assisted Language Learning and Computer-Assisted Language Learning (MALL and CALL) frameworks for content creation and social meaning making (Wong and Looi, 2010). These researchers argue that the use of CALL and MALL frameworks has shifted from content-based delivery to design-oriented approaches. There has also been a shift in learning theories; from behaviourism to constructivism. When behaviourists concentrated on vocabulary grammar acquisitions, “those embracing the communicative use of technology stressed the use of language in simulations and text reconstruction” (Wong and Looi, 2010, p. 421).

This project seeks to explore the possibility of implementing the Language Learning Activity Paradigm (LLAP), that is a purposeful, goal-oriented, rule-based and playful environment, in which knowledge originates through the “transformation of experience” (Kolb, 1984). The proposed LLAP constructivist environment could serve as a visual approach to the study of Language Arts. It could be a semantic exploration of vocabulary, allowing students to engage their intuition, empathy, logic and curiosity when learning vocabulary. The LLAP is a design oriented tool that enables students to become content generators, co-creators, social learners and social constructors of knowledge.

This prototype will serve to support my hypothesis by demonstrating the possible learning benefits for 7th grade students in Language Arts that can be attained through their engagement with the LLAP. The prototype design is the result of an ongoing reevaluation between the definition of the problem and evidence collected from alternative to traditional learning approaches.

### 1.1 Purpose of the Study

The purpose of this study is to develop an alternative learning environment, which would be more suitable for generations surrounded by the technological advances of the 21st century, and who have in turn, developed different thinking patterns from those of preceding generations (Prensky, 2001). The proposed learning ecology would keep students engaged with the learning material and improve their learning abilities by using a blended<sup>1</sup> learning environment.

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1 Blended environment is a mix of technologically mediated environment and interactions in a constructive learning experience.

The significance of this project stems from the visualization of the theoretical framework, which will be discussed later, and its implementation for the user. I will emphasize creativity and use design thinking to visually amalgamate specific learning theories as a solution for the attainment of deeper and more efficient language learning for Google Generation students. The success of the LLAP is contingent on the stakeholders' interactions or those of the learners and teachers.

## 1.2 Thesis Questions

- i. How can CALL and MALL design strategies be applied to teaching vocabulary to 7th graders and thereby increase their efficacy in language use and comprehension?
- ii. How, on a visual level, can a blended learning environment of formal and informal processes be used as a catalyst for self reflection and collaborative action-oriented learning?

## 1.3 Limitations

My intent with this project is not to invent new learning software or new learning material, but rather to create an alternative learning environment that can augment the current curriculum for Vancouver's Grade 7 Intermediate School students. The Language Learning Activity Paradigm, highlighting vocabulary study, should serve as an example for a possible new approach in language learning, with its principle applied to other areas of language study. Concentrating on only one aspect of language learning, I will be in a better position to develop the theoretical part of my research and provide a solid visual model to support my findings.

Because I do not have access to a team of computer programmers – which would be required to build and manage the technical aspects of designing the digital interface – I chose to visually represent a smaller portion of the domain to demonstrate how it can relate to a learning environment, as opposed to designing the Language Learning Activity Paradigm in its entirety.

Other than my two focus groups, only two schools were used for the purpose of the qualitative study, mainly due to the very limited access I had to the schools within the time frame that I had for the study. The schools were Henry Hudson Elementary and False Creek Elementary. Because of the limited access to only two schools, the study is not universally generalizable.

## 1.4 Barriers

Potential project obstacles are:

**CURRICULUM REQUIREMENTS** – K-12 curriculum standards may be resistant to adopting a new learning approach

**LOGISTICS** – Potential difficulties in integrating a visual semantic exploration into the time structure of a Language Arts class

**TEACHERS AND TECHNOLOGICAL ADVANCES** – Many teachers have had limited experience in integrating technology into the class room

**EVIDENCE** – Not enough studies have been done to showcase the benefits of an interactive approach to learning

**COSTS** – Interactive interfaces and software are expensive to produce and test (Klopfer, Osterweil and Salen, 2009).

## 2. BACKGROUND FOR THE STUDY

### 2.1 Language As Communication

In *The Solid Form Of Language*, Robert Bringhurst (2004) defines language<sup>2</sup> as “... what speaks us as well as what we speak” (p.10). As *homo sapiens*, we speak different languages and different languages speak us – “the language of music and mathematics, the gestural languages of the deaf, the calls of leopard frogs and whales...” (Bringhurst , 2004, p.11). In language, reading precedes its written form since “the reading of trucks and weather is a fundamental mammalian occupation” (Bringhurst, 2004, p.14). Language essentially is an agreed upon and informative arrangement in which writing is the graphic expression of a particular language that could only materialize in a culture prepared to sustain it.

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2 Language – Refers to natural language. Language is a complex system of agreed upon human communication. According to Robert Bringhurst (2004), language is the everyday human interaction that takes place between one another, different species and objects. It is a system of symbols, grammars and signs used to define meaning. For the purpose of this paper, I will refer to language as a written form of human communication.

History suggests that starting from nothing, people have evolved from oral culture to literate culture at least three times: in Mesopotamia some 5,000 years ago; northern China 4,500 years ago; and in Guatemala and Mexico almost 3,500 years ago. In each case the writing began with pictures advancing into their graphical representation, and then syllables. (Drucker and McVarish, 2008). Changing cultural conditions, with the help of technology operating within continuously evolving cultural circumstances, provided necessary ground for the evolution of writing and language in general (Drucker and McVarish, 2008).

## 2.2 Language And Technology

Language evolved from oral culture, to pictographic forms, to Phoenician writing and alphabets. Its transformation continued as document format, automated typography and Linotype machines were gradually dispersed into human culture (Drucker and McVarish, 2008). Research suggests that in the past twenty years, technology – with the invention of the Internet, instant messaging and text-based applications such as Twitter and Facebook – has greatly modified the written form of language by delivering immediate and mobile communication into people’s everyday lives (Carr, 2005; Crystal, 2009; Fridman, 2009).

The evolution of the Internet has provided new text formats and new aspirations for communication, as well as “new ways to interact with information that can confuse and overwhelm people taught to extract meaning from only conventional print” (Coiro, 2003, n.p). Although electronic text has introduced numerous innovative possibilities, it has also “cause(ed) some challenges that can have a great impact on an individual’s ability to comprehend what he or she reads” (Coiro, 2003, n.p).

Because of the universality of text on the Internet, and the prominence of text-messaging on mobile devices, people are reading more today than they did in the past but it is a fragmented kind of reading (University College London, 2008). There is a “mosaic”<sup>3</sup> fragmentation of information, in which segments of illumination are disseminated all over cyberspace, some of which may elude retrieval. Bruce Friedman<sup>4</sup> (2009), who writes about the use of computers in medicine, illustrates how the Internet has altered his own communicative habits. In his blog, Friedman (2009) notes that his cognitive abilities have taken on a “staccato” quality, reflecting the way

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3 From a conversation with Sharon Romero, an associate professor at Emily Carr University (December 1st, 2009).

4 Bruce Friedman is a pathologist on the faculty of the University of Michigan Medical School.

he instantly scans short passages of text from a variety of sources online

In *Proust and the Squid: The Story and Science of the Reading Brain*, Maryanne Wolf<sup>5</sup> (2008) argues that by “reading online, we are inclined to become ‘decoders of information’, and our ability to interpret text, to make the rich mental connections that form when we read deeply and without distraction, remains largely disengaged” (n.p). She further notes, “reading within digital media ‘puts efficiency and immediacy’ above all else, maybe weakening our capacity for the kind of deep reading that emerged when an earlier technology, the printing press, made long and complex works of prose commonplace” (Carr, 2008, n.p).

With expeditious technological progress, human beings grow more dependent on machinery, passively consuming convenient “idiot-proofing” technology (McCullough, 2005, p. 156). As Manzini (1992) notes, “the extraordinary ‘invention’ of modern thought consists of simplifying reality to simple and even easily attained goals” (p. 228). Developmental Topographical Disorientation (DTD), is a modern form of mental disorder, culminating in the incapacity of the brain to form a “cognitive map” due to heavy reliance on GPS technology (Hutchinson, 2009, p. 30). As much as “a brain determines how one navigates, one’s navigational efforts also shape a brain” (Hutchinson, 2009, p. 30).

DTD disorder echoes the recent decline in the human capacity to comprehend traditional written information. In describing the effect of the digital transition on library, users’ research habits, a study done by the University College London (2008) observed:

The implications of a shift from the library as a physical space to the library as virtual digital environment are immense and truly disruptive. Library users demand 24/7 access, instant gratification at a click, and are increasingly looking for “the answer” rather than for a particular format: a research monograph or a journal article for instance. So they scan, flick and “power browse” their way through digital content, developing new forms of online reading in a way that we do not yet fully understand (p. 8).

“We no longer know what we know”<sup>6</sup> summarizes the phenomena we experience on a daily basis. The abundance of technologically provided information that people are exposed to every day does not contribute to their understanding of it.

Communication, as Enochsson (2005) suggests, is a crucial and necessary art for gather-

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5 Maryanne Wolf, a developmental psychologist at Tufts University, Medford, MA.

6 From the conversation with Sharon Romero, an associate professor at Emily Carr University (December 1st, 2009).

ing information. In her argument she states that “when seeking information on the Internet there is usually a need to master the written language. Even seeking pictures needs a written keyword. Language itself is needed for communication and to express and formulate questions about something you want to know” (Enochsson, 2005, n.p).

### **3. RESEARCH**

#### **3.1 Problem Definition**

##### **a. Literature and Filed Observations**

###### **I. GOOGLE GENERATION <sup>7</sup>**

Technology, operating “within changing cultural circumstances” and with the development of new tools, has always adjusted humans’ means of communication (Drucker and McVarish, 2008, p.xxv), and language is our main means of communication. The written form of language functioned in a radically different way when the main method of production changed from pen and ink to metal. Digital technology, operating “within changing cultural circumstances”, has of course also contributed, on many levels, to the rapid changes in communicative habits and behaviour, with the emergence of the Internet, mobile devices and social networking.

Researchers advise that today’s youth have been surrounded by and accustomed to using digital media from a very early age (Prensky, 2001; and Weigel, James, Gardner, 2009). Young Americans “spend more time engaging with digital media at critical developmental stages than their older counterparts did” (Weigel, 2009, p.8). A *Kaiser Family Foundation Study* (Rideout, 2010) conducted for the year 2009 found a total of nearly 12 hours of media exposure in a typical day for the average 11–14 year-old individual, and a total of nearly 8 hours of media exposure for 8–10 year-olds. Furthermore, the study had determined an overall increase in the 8–18 year-olds media use over the past 10 years, with the exception of reading (Rideout, 2010). The research

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<sup>7</sup> Two different schools were utilized in this study: Henry Hudson Elementary and False Creek Elementary. The main difference observed between the two schools was the use of mobile technologies. The use of cell phones among students in False Creek Elementary was higher than that of Henry Hudson Elementary students





Figure 3.1 11 year old Sasha. Family No. 2. Photo by Slava Shmakin



Figure 3.2 Children from families No. 2 and 3 are playing Nintendo DS games together.  
Photo by Slava Shmakin

found that “in just the past five years, the increases range from 24 minutes a day for video games, to 27 minutes a day for computers, 38 minutes a day for tv content, and 47 minutes a day for music and other audio. During this same period, time spent reading went from 43 to 38 minutes a day” (Rideout, 2010, p.18).

Addressing the use of mobile devices, the *Kaiser Family Foundation Study* (2010) discovered that 66% of all 8–18 year-old individuals own their own mobile devices, which they use to send an average of 118 messages, and talk for approximately 33 minutes in a typical day; the 7th–12th graders reported spending about an hour and a half per day texting and messaging.

Research also shows that over half of American teens participate in social networking activities and almost all of them engage in some kind of video gameplay (Weigel, James, Gardner, 2009, p. 8). However, there is an implied gender gap in terms of time spent using computers: the *Kaiser Family Foundation Study* suggested that boys spend more time playing computer games and watching videos on sites such as YouTube than girls, while girls devote more time to visiting social networking sites than their male peers (Rideout, 2010).

## II. GOOGLE GENERATION OBSERVATION

Prior to implementing the research, approval for the project was obtained from the Research Ethics Board of the Emily Carr University of Art and Design and the Vancouver School Board. Consent forms (see Appendix “A” ) were provided for each participant. Images of human participants which appear in the thesis have been released for the study. Permission to identify the children by their first name was granted as well. Following approval from the University's Research Ethics Board I conducted indirect and direct observational sessions with three different families – a family with a 10 year-old boy (family No. 1), another family with a 10 year-old girl and an 11 year-old boy (family No. 2, Figure 3.1), and a family with a 9 year-old girl (family No. 3). One of the main goals was to determine the children’s use of digital media and how it affected their habits and behaviour. During my visits, which took place in the afternoons on weekdays and in the mornings on weekends for up to four hours at a time, I observed the children’s daily activities (Figure 3.3).

From these observational sessions I concluded that in all three families, the children were immersed in digital media activities (video gaming and social media), on average, for up to 3.5 hours a day on a typical weekday, and up to 4 hours a day on a typical weekend . I also noted that the parents in all three families were supervising their children’s media use, especially the tv content and console gameplay.

The 10 year-old boy from the middle class family No.1, occupied himself with console gaming activities, playing *Super Mario* and *Return to Castle Wolfenstein* video games. He also engaged in some basic computer programming (BASIC, C), and watched TV<sup>8</sup>. Other activities were sports based.

The 9 year-old girl (Figure 3.2) from family No. 3, was the youngest child that I observed. She spent her free time playing Nintendo DS games like *Super Mario*, *Toy Story* and miscellaneous online games such as *Club Penguin*. She also engaged in watching tv. The children from family



Figure 3.3 Children from families No. 1, 2 and 3 are playing *Super Mario*. Photo by Slava Shmakin



Figure 3.4 Kate, family No. 2, is showing her board games. Photo by Slava Shmakin

No. 3 also displayed similar digital media use habits to that of families No. 1 and No. 2. The 11 year-old boy mostly played console games such as *Super Mario* and *Return to Castle Wolfenstein*. He also created simple websites in order to interact with his friends and to explore the field of computer programming. He and his younger sister were also enrolled in tennis lessons. I observed that the 10 year-old girl was an active participant in all her brother's console gaming activities. She favoured arts and crafts related activities, reading and board games (Figure 3.4). She was spotted playing online games and browsing the Internet on many occasions, but during my visits I did not detect her reading or playing board games. The children from family No. 3 were not encouraged by their parents to watch tv.

Following my observations and with approval from the University's Research Ethics

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8 Please note that time spent on digital media activities was strictly reinforced by parents in all observed families.

Board and the Vancouver School Board (Appendix “C”) I next conducted a small focus group interview in a grade 6 Language Arts class at False Creek Elementary School (Figure 3.5) . This session also illustrated a constant use of digital media among the students. Some of the children expressed familiarity with programming and console games; most spoke of constant engagement with online and Nintendo DS gaming. The boys preferred playing console games, while the girls’ gaming habits were focused more on social networking activities. Both genders favoured playing with Nintendo DS. My interview with the False Creek Elementary School principal, Bruce Murton revealed that 60% of the current grade 6 students had mobile devices and 70% of them had Facebook accounts.

### III. TRADITIONAL LEARNING SYSTEM

The results from my fieldwork study echo Marc Prensky’s (2001) analysis of Google Generation (GG) students. As he points out, today’s students are “native speakers’ of the digital language of computers, video games and the Internet” (Prensky, 2001, p.1), noting that they are not the same kind of students our educational system was designed for. The traditional learning system itself is a sharp contrast to the digital world they are experiencing on a daily basis.



Figure 3.5 False Creek Community School, Vancouver, BC. Grade 6 classroom. Photo by Slava Shmakin

The GG, who on average spend over 10,000 hours of their childhood lives playing video games and less than 5,000 hours reading, does not find the traditional learning system challenging, motivating or stimulating (Prensky, 2001). Students “are typically trapped, either physically in a classroom, or by their goals” (Prensky, 2001, p.3). It is obvious that the GG’s learning process could not be achieved through traditional “painfulness” and “drudgery” (Prensky, 2001, p.2). These students understand and process information differently from previous generations for whom the current educational system was originally developed (Prensky, 2001); hence, a fracture in traditional learning has been created.



Figure 3.6 Student at Language Arts Class.  
Photo by Slava Shmakin



Figure 3.7 Wordly Wise 3000 –Language Arts text book. Photo by Slava Shmakin

Prensky, in speaking about a decline in educational outcomes in the U.S. (2001) argues that the system does not take into account the technologically dominant environment GG students are subjected to. He further suggests that this environment has altered the GG’s cognitive development, which has resulted in the students’ inability to be engaged with an outdated learning system (Prensky, 2001).

Weigel, James, and Gardner, in *Learning: Peering Backward And Looking Forward In The Digital Era* (2009), – a paper on multiple projects such as *Harvard Project Zero* and *The Developing Minds* and *Digital Media Projects* – addresses the learning outcomes of past and present educational systems. The authors state that “education – teaching and learning – changes very slowly. The texts, the teacher-dominated lectures... are not that different from those that could have been observed a century ago” (Weigel, James, Gardner, 2009, p. 5). This statement is reflected in Sir Ken Robinson’s 2010 TED talk in which he criticized the traditional learning system, arguing that it is in fact outdated and irrelevant. He concluded his talk with the statement that a paradigm shift is required in order to sustain productive and congruent learning (Robinson, 2010).

For most of the educational systems established around the world, a teacher is thought to be the center of knowledge, while students are assumed to be mere “empty vessels”, into which knowledge is being deposited (Weigel, James, Gardner, 2009, p.6). The “uniform schooling” system following a “one curriculum fits all” model is not appropriate for the GG, whose minds are operating within digital environments (Weigel, James, Gardner, 2009). Students of today utilise different options for understanding and knowledge creation including visual, textual and game-based systems. They employ a social learning model – peer -to -peer apprenticeship and collaboration – offered by digital technologies, contradictory to the traditional classroom schema, where each student is expected to operate as an independent body subject to direction by the teacher.

The constant presence of digital media in the lives of the GG yields to a more contextualized and constructivist learning approach, as opposed to a “teacher-centric” traditional learning model, since a constructivist approach involves more participation on the part of the learner and is complemented with digital technology resources. It is obvious that students’ constant use of digital devices is changing their lifestyles “toward frequent mediated immersion, which in turn is shaping their learning styles...” (Weigel, James, Gardner, 2009, p.14).

#### IV. FALSE CREEK ELEMENTARY SCHOOL – OBSERVATION

In order to better understand the learning ecology as well as the students’ behavioral patterns, I conducted an indirect observational session in the grade 6 Language Arts class of a False Creek Elementary School teacher, through which I was able to witness students’ involvement with the learning process and their interactions with their teacher and each other. During my 2.5 hour stay, I took written notes and photographs that captured reflections, emotional responses, specific details and interactions among the students. I noticed a strong tendency towards social learning



Figure 3.8 Unrelated to class students’ activities. Photo by Slava Shmakin

and an overall lack of motivation and engagement with the study material.

Only 5 students, out of the 29 present, were actively engaged with the learning material, interacting with the teacher and answering questions. I noticed a constant commotion in the room, and many of the students were distracted by things not relevant to the class, like drawing, reading books (e.g. *Diary of a Wimpy Kid*, by Jeff Kinney, which is a storyboard based book), lying on their desks, and talking to each other (Figure 3.8). After a brief 10-minute explanation of prefixes, students were given a double sided paper with exercises to work on. Most of the students were confused by the task and proceeded with the wrong exercises located on the other side of the paper. This, in my view, was the result of the deficiency in the students' attention. Students also struggled with the explained guidelines and displayed difficulties completing the exercises due to the confusing overall design of the learning activities in their text workbook. Upon completion of the exercises, the class proceeded to the study of story writing techniques. To me, this learning format did not look any different from that of 10 years ago (Figure 3.9).

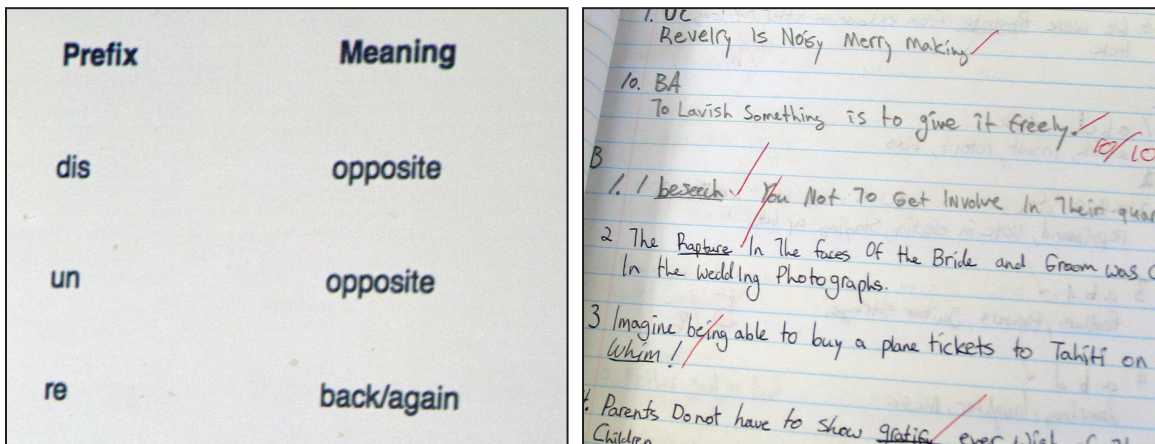


Figure 3.9 Language Arts text book learning material and completed student test.  
Photo by Slava Shmakin

## V. THE VERSATILE GENERATION

Prensky (2001) claimed that in many ways the traditional learning system is not applicable for the GG's versatile intellect. As a generation that has grown up in a digital interactive environment, the GG has developed adaptable metacognitive skills. These skills include multidimensional visual-spatial skills; learning "on-the-go" (learning while exploring an unfamiliar environment); and "attention deployment" skills – attending several activities simultaneously (Greenfield, 1984). Accessing information in the first instance via images; using text to analyze and explore; and responding rapidly to stimulation, are all tendencies that have been observed (Greenfield, 1984).

In addition, the GG has acquired hypertext mind structures that are parallel and not sequential, which allows them to process information simultaneously and from a range of different sources (Greenfield, 1984).

My own observations, conducted within the three different families and at False Creek Elementary School, depict the GG students as active learners of real and simulated experiences. They demonstrated abilities such as visual adaptation, and self-reflection, as well as social and collaborative behaviours. These students are naturally inclined towards co-designed learning experiences as they are predisposed to explore information in a non-linear manner. They are fluent in multiple media, are used to navigating diverse information sources and function significantly better when networked. The GG learners process information rapidly and display impatience for traditional school presentations, “step by step logic” and “tell-test” instructions (Prensky, 2001). The GG students have a desire for the unexpected and a need to be constantly challenged (Prensky 2001, Sherry Turkle 2010).

These observations emphasize that the GG is a versatile generation that is in need of a new learning methodology that can exploit its unique characteristics. However, as numerous sources for this project have postulated, left on their own and not properly developed, these GG's attributes can have a negative impact on their cognitive development of deep context learning.



Figure 3.10 Children from families No. 1 and 3 are actively engaged in video gaming.  
Photo by Slava Shmakin

## VI. BEHAVIOUR AND INFORMATION TECHNOLOGY

As well as cultivating unique opportunities and brilliant adaptable skills, digital media also raises



rather alarming issues. The decline of literacy, question of personal autonomy and fragmented attention, are some of the common concerns raised by academia (Digital Nation, 2007). Students are thought to be distracted while using multiple media and are not performing at school as well as they are expected to (Digital Nation, 2007). Bauerlein (Digital Nation, 2007) claimed that today's students were less productive due to habitual digital distractions. He insisted "... (students) reading deteriorated and their writing skills suffer as kids grow up" (Digital Nation, 2007, n.p). And as Nass points out "kids write paragraphs as opposed to essays, ...they are being constantly distracted..." (Digital Nation, 2007, n.p).

In an interview conducted by the *Digital Nation* TV program, MIT<sup>9</sup> students reported the decay of their own writing skills, and also reflected on the rapid development of their Internet inflicted issues (Digital Nation, 2007). Many learners displayed the so called "Paradox of Choice"<sup>10</sup> problem, in which the availability of an unlimited range of information sources could be overwhelming and confusing rather than liberating.

Weigel, James, and Gardner (2009) proposed that "the Internet's potential for learning may be curtailed if youth lack key skills for navigating it, if they consistently engage with Internet resources in a shallow fashion, and/or if they limit their explorations to a narrow band of things they believe are worth knowing" (p. 9). Current research suggests that as a result of growing up with a cognitive load caused by a technologically dominant and rapidly changing environment, the GG has developed habits and behaviour that can be damaging to their comprehension skills (University College of London, 2008). The University College of London research describes these characteristics as surfing the Internet to avoid traditional reading formats; viewing an abundance of pages, many of which have no real content; showing no interest in text rich readings and difficulty in comprehending information.

Research also suggests that the GG's browsing time is equivalent to their reading time, with little time spent on evaluating information in terms of accuracy as they settle for a "quick" found answer (University College of London, 2008). Faced with text, students display "horizontal skimming", "bouncing", "flicking" and quick scanning behavioural activities (University College of London, 2008). And although in a digitally dominant and information-heavy environment, skimming is perceived as an essential skill, students engaged with shallow content "may be less

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9 Massachusetts Institute of Technology, a research university located in Cambridge, Massachusetts. USA.

10 *The Paradox of Choice - Why More Is Less* – a book written by Barry Schwartz. In his book, Schwartz argues that giving people too many choices tends to lessen their satisfaction.

able to sustain a directed focus, assess findings, and reflect upon the meaning and significance of rapidly encountered information” (Weigel, James, Gardner, 2009, p. 10).

A recently published study of online research habits, conducted by scholars from the University College of London (2008), investigating the Google Generation, clearly showed that digital media contributes to a fragmentation of intelligence. As part of the five-year research program, the scholars examined computer logs, that recorded the behaviour of visitors to popular research sites that provide access to different sources of written information. They discovered that individuals using the sites exhibited “a form of skimming activity,” rapidly moving from one source to another and rarely returning to any source they had previously visited (University College of London, 2008). Additionally, the scholars found that users read no more than one or two pages of written information before they would “jump” to another source (University College of London, 2008). The authors of the study report:

It is clear that users are not reading online in the traditional sense; indeed there are signs that new forms of “reading” are emerging as users “power browse” horizontally through titles, content pages and abstracts going for quick wins. It almost seems that they go online to avoid reading in the traditional sense (p. 10).

My qualitative study of students from the three families previously mentioned, demonstrated that students do have enthusiasm for reading. When interviewed, all participants expressed a great interest in traditional reading formats, often referring to their extensive book collections; yet I also observed them display difficulties in staying focused while reading, as they often resorted to “jumping” and “skimming”. My conclusion mirrored the information I received from participants’ parents who suggested that despite a strong interest in traditional reading,

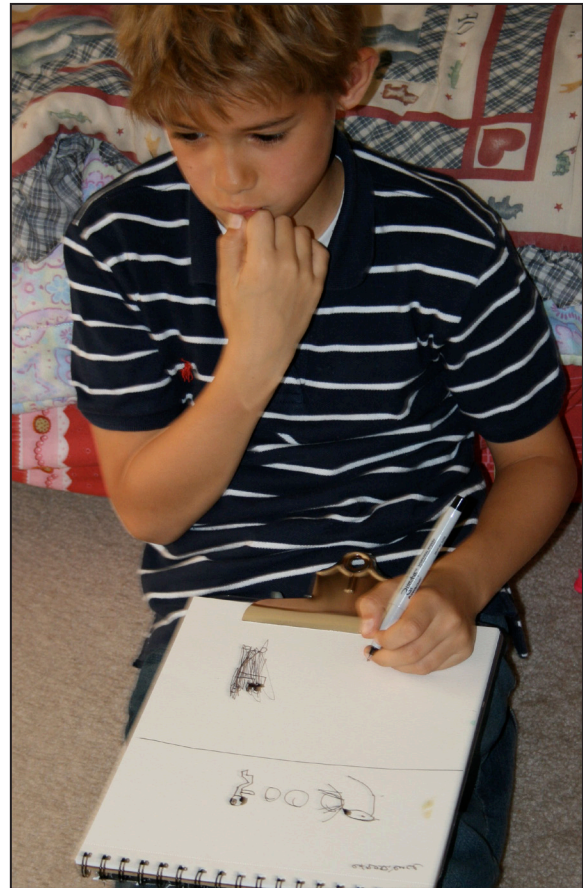


Figure 3.11 Anton, family No. 2, is visualizing his English learning experiences. Photo by Slava Shmakin

children found it hard to engage with reading in a sustained fashion.

In the digital “idiot-proofed” environment, the GG have developed a habit of assuming that technology understands their inquiries and will give them an answer without their being engaged in the inquiry process (University College of London, 2008). When the GG students access information online, their search skills are typically minimal. Since students are trained in the traditional learning system based on books, they may find it challenging to apply these traditional skills to online sources (Weigel, James, Gardner, 2009). By way of an example these authors state that “a link listed as Google’s top result is all too often interpreted as a credible marker for information sources. The growing presence of commercial interests behind or alongside content is particularly problematic in this regard” (p. 10).

A strong dependency on digital communicative technology has also resulted in an incapacity for evaluation, reflection and critical thinking (Hutchinson, 2009, p. 30). Such important skills as verbal memory, concentration and attention are rapidly disintegrating. Essentially, Weigel, James and Gardner (2009) claim that “if schools do not take seriously the positive and negative potentials of digital media for learning, they risk becoming increasingly irrelevant to the lives students lead outside of school and to the futures for which they are being prepared” (p. 14). Yet, as Marzano suggested, “...technology itself is neither good or bad; it is how we use it that makes the difference” (Marzano, 2001, p. 8).

## 3.2 Alternative Systems Evidence

### a. Introduction

A report published by Digital Nation (2007) revealed that the GG student needs to be stimulated in ways that are different from the previous generation of learners. This is not surprising, considering youth’s constant exposure to digital media. In a 2010 TED talk, Jane McGonigal showed that by the time the GG student graduates from high school she/he will have spent 10, 000 hours interacting with digital media, including a variety of gameplay and networking activities (Table 3.1). According to Malcolm Gladwell, this exposure will make them ‘outliers’<sup>11</sup> (McGonigal, 2010). McGonigal (2010) adds to this by asking what kind of endeavors potentially contribute to the GG’s

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11 Malcolm Gladwell’s book *The Outliers* (2008) examines the factors that contribute to success, including a 10,000 hour rule, by which practicing a specific task for 10,000 hours assures expertise in any professional field.

high probability of future success.

## b. Theoretical Framework Overview

Studies that identify gaming activities as promising new educational techniques observe that video games have recently exceeded Hollywood films in annual sales and hence, have become one of the most popular forms of entertainment (Barab, 2009). However entertaining, gaming also offers the GG a chance to experience new environments and create scenarios within which they can learn.

Prensky's work (2001, 2002) established numerous core "game-originated" characteristics, which if incorporated into an education system, could provide strong learning benefits. He argues that games are a form of fun and play, producing enjoyment, pleasure and passionate involvement with the content. Games also consist of rules and goals, which create structure and motivation for a player (Prensky, 2002). Via the interactive nature of gaming, the aspect of purposeful action, of "doing", emerges. While outcomes and feedback provide students with a learning process, representation and story elements tend to support emotional engagement (Prensky, 2002).

Games involve problem solving and interactive features and hence, are capable of generating creative and socially infused environments (Prensky, 2002). The GG, who are habitually inclined towards social grouping, often use digital technology as a raw "canvas" for collective par-

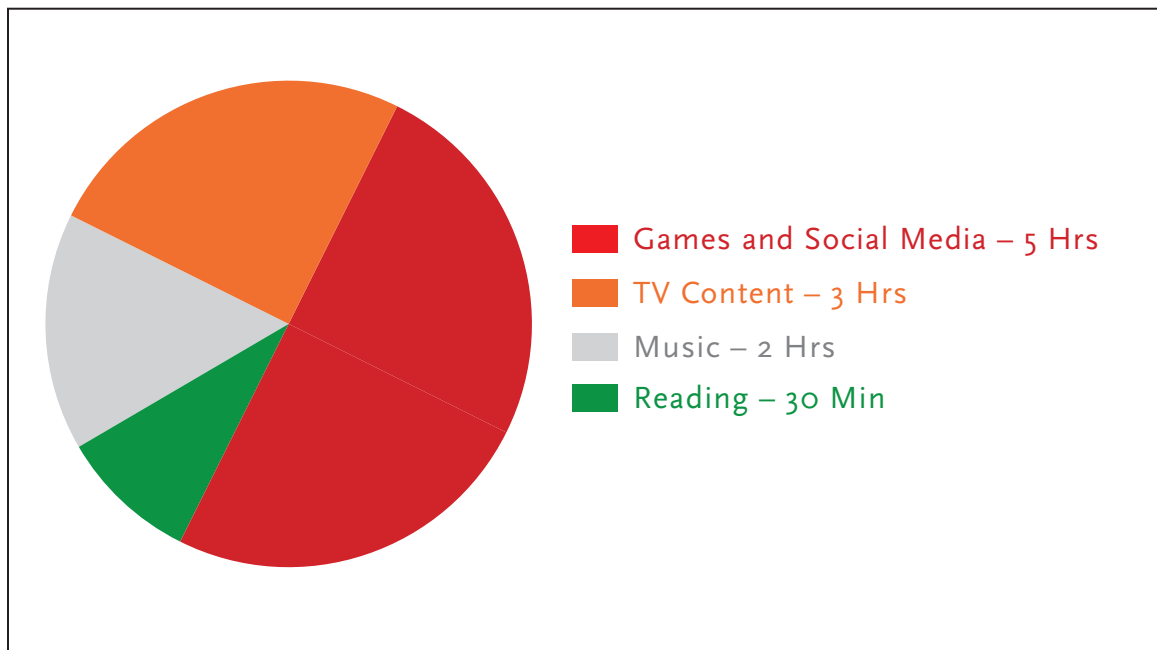


Table 3.1 Media use per day graph, ages 9–12

participation in the formation of ideas. As Johnson explains (2010), digital technology increases people's connectivity and provides an ideal ground for building, connecting and exchanging ideas.

Prensky's gaming philosophy echoes Kolb's *Experimental Learning Theory* and Bloom's *The Taxonomy of Learning* principles (see tables Tables 3.2 and 3.3) (Bloom, 1956; Kolb, 1984). The approach of learning through active doing, as described by Kolb, suggests the application of so-called "transfer of an experience" into the learning process, by creating a stimulation for knowledge, new quests and the incorporation of individual motifs and personal connections into the learning process itself (Kolb, 1984).

Kolb's theory illustrates four stages in learning, which are described as follows: Concrete Experience, Reflective Observation, Abstract Conceptualization and Active Experimentation. The Concrete Experience stage is the experience of a given activity, such as a classroom session, and is the precursor to Reflective Observation on that experience, often involving personal motifs, thoughts and emotions. Reflective Observation is followed by the Abstract Conceptualization stage, which consists of the learner's synthesis of knowledge and principles from what was observed. The Active Experimentation stage is the construction of a plan that modifies the next occurrence for a forthcoming experience. Active Experimentation then advances to the next Concrete Experience, where the new knowledge can be applied (Kolb, 1984).

In *The Taxonomy of Learning*, Bloom (1965) illustrates the experience of learning as being a part of the learning process itself, and elucidates six domains through which deep and heterogeneous knowledge can be attained. He argues that the first domain of successful formation of cognition is a recall of received knowledge, followed by the second domain, an understanding of knowledge, where knowledge exploration commences. An application of knowledge in new situations constitutes the third domain (Bloom, 1965). Bloom (1965) then describes the fourth domain of acquisition of cognition as analysis of the knowledge that arises from utilization of critical thinking. The fifth domain is a synthesis of information gleaned through creative thinking. The sixth, and highest, domain in Bloom's taxonomy pyramid is evaluation, where one is involved in the judgement of produced information (Bloom, 1965).

The results of my previous examination of gaming pointed to a resemblance between Bloom's and Kolb's theories as applied to gaming activities. By applying theoretical frameworks to gaming, I determined that players immersed in a gaming activity engage in recall, comprehension, application, analysis, synthesis and evaluation of information, as part of the gaming process.

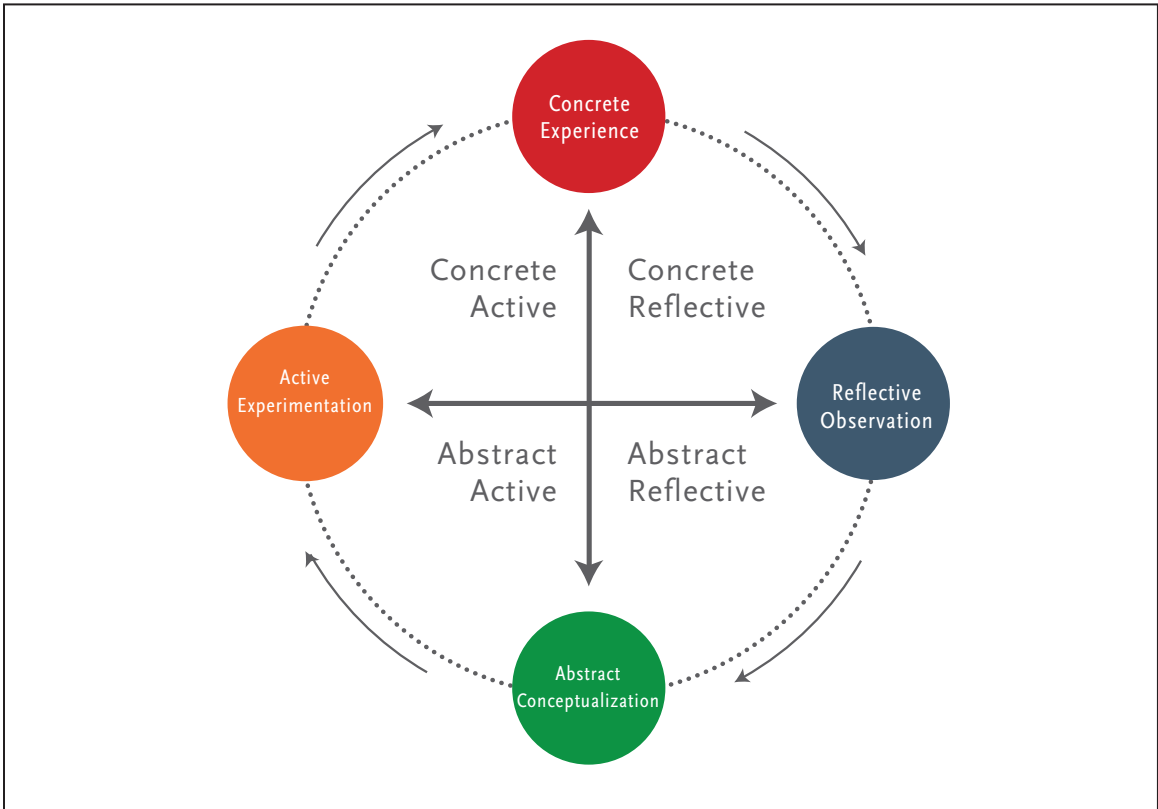


Table 3.2 Kolb's *Experimental Learning Theory* graph

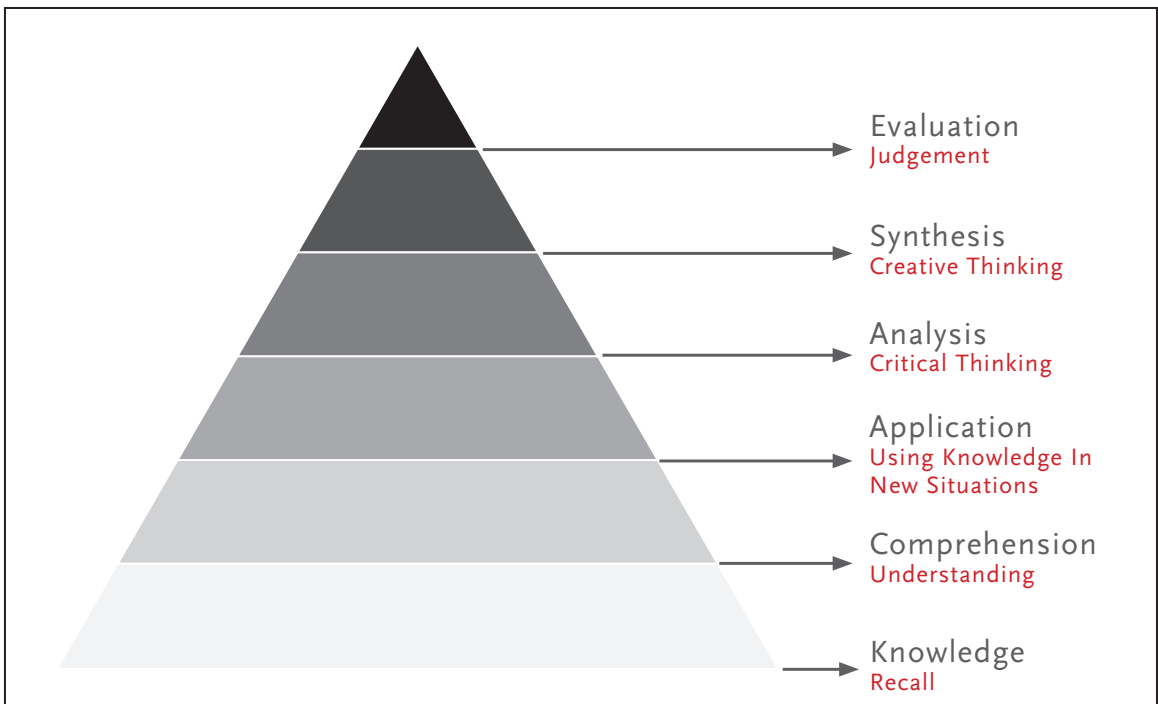


Table 3.3 Bloom's *The Taxonomy Of Learning* graph

They also participate in the processes of Concrete Experience, Reflective Observation, Abstract Conceptualization and Active Experimentation. Hence, it could be argued that gaming is, in fact, a form of active learning, which mirrors Bloom's *Taxonomy of Learning* and Kolb's *Experimental Learning Theory*.

My observation of children on a playground, who collectively engaged in the repetitive activity of launching a plastic bottle down a stream – watching it glide away, and eventually, after a number of tryouts, modifying the stream to prevent the bottle from floating off in an undesirable direction – suggested that children essentially have been exploring the physical nature of things. Researchers explained that a child at play is exercising five distinct aspects of freedom: freedom to fail; freedom to experiment; freedom to fashion identities; freedom of effort; and freedom of interpretation (Klopfer, Osterweil, and Salen, 2009). I believe that these five aspects of freedom constitute the learning-by-doing method described in Kolb's *Experimental Learning Theory* and Bloom's *The Taxonomy of Learning*. They are important for producing new knowledge and for the construction of knowledge.

I expect that by employing the interconnectivity of “learning-by-doing” ideas within the language learning educational framework, motivational, deep and heterogeneous knowledge will emerge. Hence the investigation of alternative learning products that apply constructivist<sup>12</sup> approaches, where students are capable of becoming content generators, co-creators, and social learners, is required.

For the purpose of integrating a “learning-by-doing” approach into my project, I commenced my investigation by studying educational and other popular commercial games, as well as analysing digital educational products and interactive projects that employ technology as active learning tools. The goal of my examination was to determine the most effective method which could then be synthesised into my own research. For the complete products research description refer to Appendix “A”.

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12 Constructivism – is a theory of knowledge emphasizing the importance of the learner being actively involved in the learning process itself, contradictory to antecedent learning theory where the responsibility resided with the teacher to educate and where the learner was engaged in a rather passive learning process.

### **c. Detected Weaknesses Within Researched Products**

From the primary and secondary research, I observed that while contemporary commercial games provide one with interesting content and are empathic, motivational and stimulating, contemporary educational products and projects have not changed much from those of 1990.

Significantly, most academic content found in the educational game genre does not provide relevant exploratory grounds for students. In some cases, a product motivates students to engage only for the pleasurable aspects of it, diverting youth from learning the academic content. It is quite apparent that the “making a game out of learning” method has been mistaken for “finding the fun in learning” (Ito, 2007). Generally speaking, a lack of synthesis between educational and entertainment vernaculars persists in the educational products available today.

The literature review revealed a strong inclination towards content-based delivery (such digital games as *Word Magic* game for the iPhone, *The ClueFinders Reading Adventures*, *Knowledge Adventure*) as opposed to action-based learning, resulting only in a traditional behaviorist system situated within the digital domain. The concept of utilizing blended learning environments is absent, for the most part, in current educational products and projects. Furthermore, most of the products and projects researched do not target language arts, but rather mathematics and science.

The research also indicated that educational products are marketed directly to parents, therefore limiting the market to children under the age of ten. Typically, these products exhibit poor quality graphics and attenuated and cluttered interfaces.

## **4. LANGUAGE LEARNING ACTIVITY PARADIGM PROPOSAL DESIGNING THE VISUALIZATION**

### **4.1 Summary of Design Process**

#### **a. Introduction**

Research suggested that in order to see a paradigm shift in education to bridge the existing gap between classrooms and the ‘real world’, schools need to acknowledge the idea of the “new digital divide – one of access to knowledge rather than hardware”, and merge formal and informal learning ecologies (Green and Hannon, 2010, p. 17). Using the benefits of such digital technological



advances as collaboration, networks and authoring tools, the GG are capable of redefining their own ecology. (Green and Hannon, 2010).

Applied theoretical frameworks of gaming philosophies, which in their interactive nature produce a “doing” aspect, intersect with Kolb’s *Experimental Learning Theory* and Bloom’s *The Taxonomy of Learning* principle. This intersection became a catalytic “tipping point” for generating a deeper contextual understanding through qualitative research, field work and research into alternative systems, such as the blended learning environment of formal and informal processes. This evolved into creating the opportunity space for the concept of an alternative learning paradigm. The applied frameworks addressed the Google Generation’s learning challenges by endorsing students’ options to decipher their own learning preferences.

The proposed prototype for the LLAP explores an active learning approach, with the help of CALL and MALL frameworks. These interactive learning solutions place emphases on learner-created content, with the goal of improving the vocabulary development of grade 7 students.

My applied field work revealed how CALL and MALL design strategies can be used to teach vocabulary to 7th graders, thereby increasing their efficacy in language use and comprehension. It showcased how a blended learning environment of formal and informal processes can be used as a catalyst for self reflection and collaborative action-oriented learning.

### **a. Design Process Description**

The last stage of the thesis paper is dedicated to the description of process – the visualization of the theoretical framework and its implementation for the user. The discourse emphasized creativity and design thinking to visually amalgamate specific learning theories in order to attain a deeper and more efficient language learning system for the Google Generation student.

The Language Learning Activity Paradigm (LLAP) is a five-staged process (see Table 4.1), based on the theoretical framing, field work at Henry Hudson Elementary School in Vancouver BC, and various visual systems. The first stage defined students’ needs via cultural probing and participatory design (refer to Appendix “B”). Information received was converted into graphs and charts. I continually assessed my assumptions regarding the students’ needs based on the literature review, group discussions with teachers and students, and student observations. The data collected was compared with the students’ responses attained from the cultural probes. This context mapping generated a student needs code of high, medium or low priorities. It also provided me with more a objective understanding of the GG beliefs and desires, aesthetic preferences and

cultural concerns; more relevant information for designing an appropriate LLAP.

The information obtained from stage one led to the initial visualization of the paradigm, which constituted stage two of the process. Phase three, the concept proof – paper iteration, determined the validity of the proposed Language Learning Activity Paradigm, and demonstrated the most effective way to transfer traditional language learning into an active learning process. Then, after synthesizing the results from my concept proof acquired from the language learning activity session at Henry Hudson Elementary School, I re-framed the problem.

The Language Learning Activity Paradigm prototype testing constituted stages four and five, where information appropriated and analysed from stage three, aided in the final design of the learning activity. For stage four, I produced dynamic paper interfaces and asked students' to navigate them. This task clarified the student's cognitive understanding of the paradigm, detected any weaknesses in the navigation and visualizations and brought forth new ideas and solutions for the proposed design. The feedback received resulted in additional revisions and updates to the prototype.

The fifth and final phase of the process, was a working, proof-of-concept prototype, that demonstrated the translation of a traditional lesson plan into a paradigm of active learning by appropriating an existing grade 7 curriculum. The user trials succeeded in demonstrating the possible learning benefits for Grade 7 students learning language.

## **4.2 Field Work**

### **a. Concept Proof for the Prototype, Paper Iteration**

#### **I. INTRODUCTION – LESSON PLAN**

The cultural probes and participatory design data (refer to Appendix “B”), which was gathered, evaluated and integrated with my former focus group, qualitative research results and academic sources, evolved into a preliminary Language Learning Activity Paradigm – concept poof. The concept proof was designed to determine the validity of the proposed idea and to demonstrate the most effective way to transfer a traditional language learning activity into an active learning process. After the evaluation of researched information, I decided to employ a gaming approach by incorporating Kolb's *Experimental Learning Theory* and Bloom's *The Taxonomy of Learning* to create an active learning environment for grade 7 GG students. Based on the results of the cultural

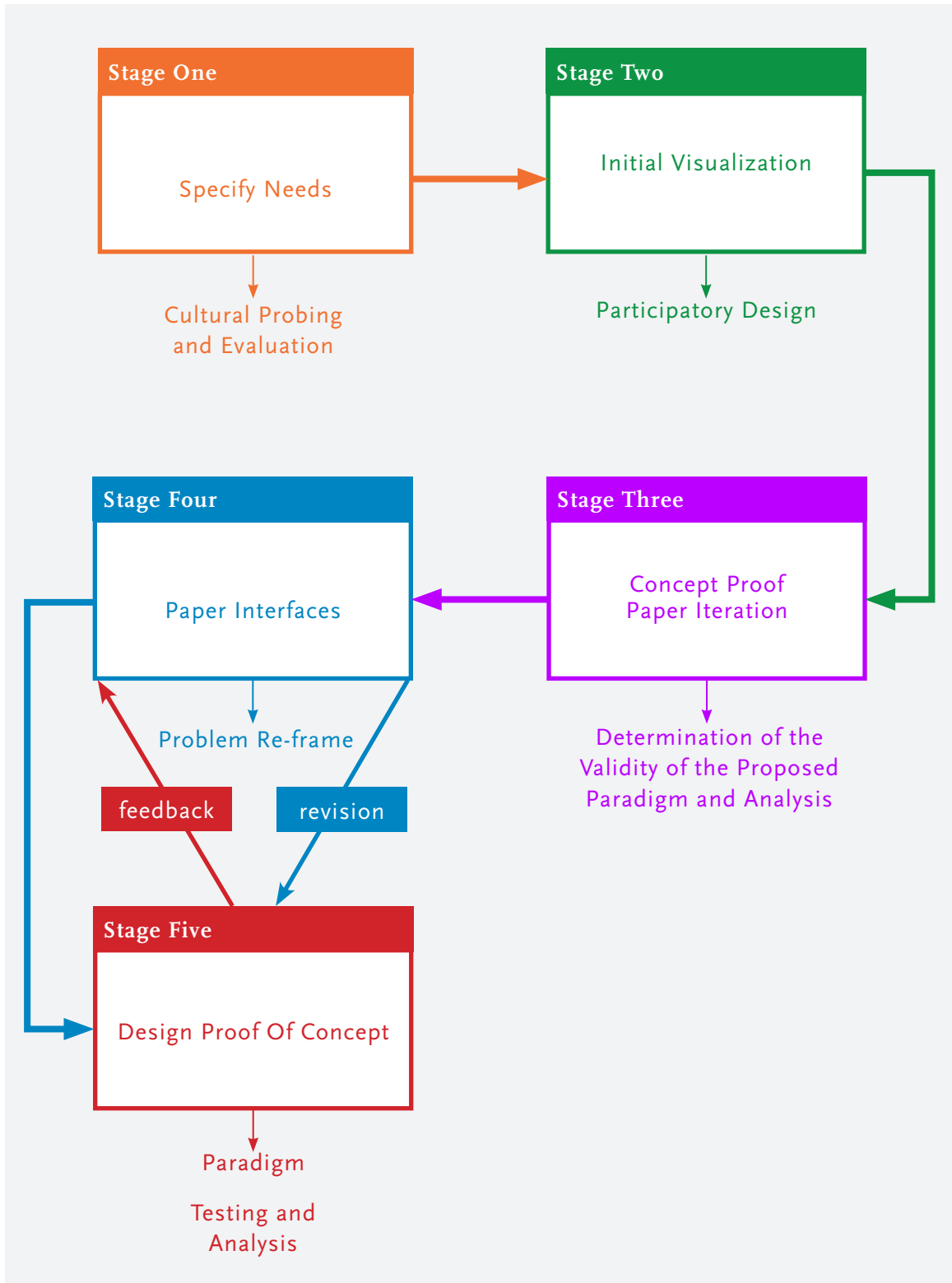


Table 4.1 Design process graph

probes, which illustrated the student's significant needs for activities outside of the classroom, I decided to design an active learning environment, as opposed to creating just another digital game.

The Language Learning Activity Paradigm (LLAP) is an environment, just as much as it is a product, in which students can explore, collaborate, make meaning and evaluate and exchange information. It consists of a four-part lesson plan (see Table 4.2), translated into a paradigm of active learning, where knowledge is originated in both formal and informal environments and where MALL and CALL frameworks are used for content creation. The proposed LLAP environment serves as an educational tool for the study of Language Arts. It is an independent semantic exploration of vocabulary, which allows students to engage their intuition, empathy, and curiosity; as learners they become content generators, co-creators, and social learners.

The designed lesson plan is based on the existing grade 7 level vocabulary study and the Language Arts curriculum of the Ministry of Education, British Columbia. Part No. 1, contextual vocabulary learning, commences in a formal environment – a classroom led by a teacher – and represents Kolb's Concrete Experience. It is an environment where recall of received knowledge is taking place.

Understanding of previously received knowledge, or knowledge exploration, constitutes part No. 2. It reflects the second domain of Bloom's taxonomy – understanding of knowledge –and is related to Kolb's Reflective Observation (Bloom, 1965; Kolb, 1984). Students participate in a collaborative dialogue and meaning making process. They actively explore vocabulary in an informal setting– outside of the classroom – with the help of mobile devices, which allow data collection, production and communication. In the second part of the lesson plan students investigate vocabulary in a game-like, playful manner, engaging their intuition, empathy, personal motifs, sociocultural background, and curiosity. Students take still images, make movies and create scenarios for the words being studied. By “marrying words to actions, images, experiences, dialogue, (and) goals”, the GG create situated understanding (Digital Nation, James Gee, 2010).

Part No. 3 of the LLAP lesson plan also occurs within an informal environment. With the help of MALL and CALL frameworks, students, working in groups, apply the knowledge they have gathered and explored by completing a quest. They are asked to construct a story, using the images and movies that they have produced in part No. 2. They are required to write their own short narrative, visualize it by coding it, and then send it to another group for decoding by writing their own understanding of the visual narrative. Every group has a chance to write a story, produce a

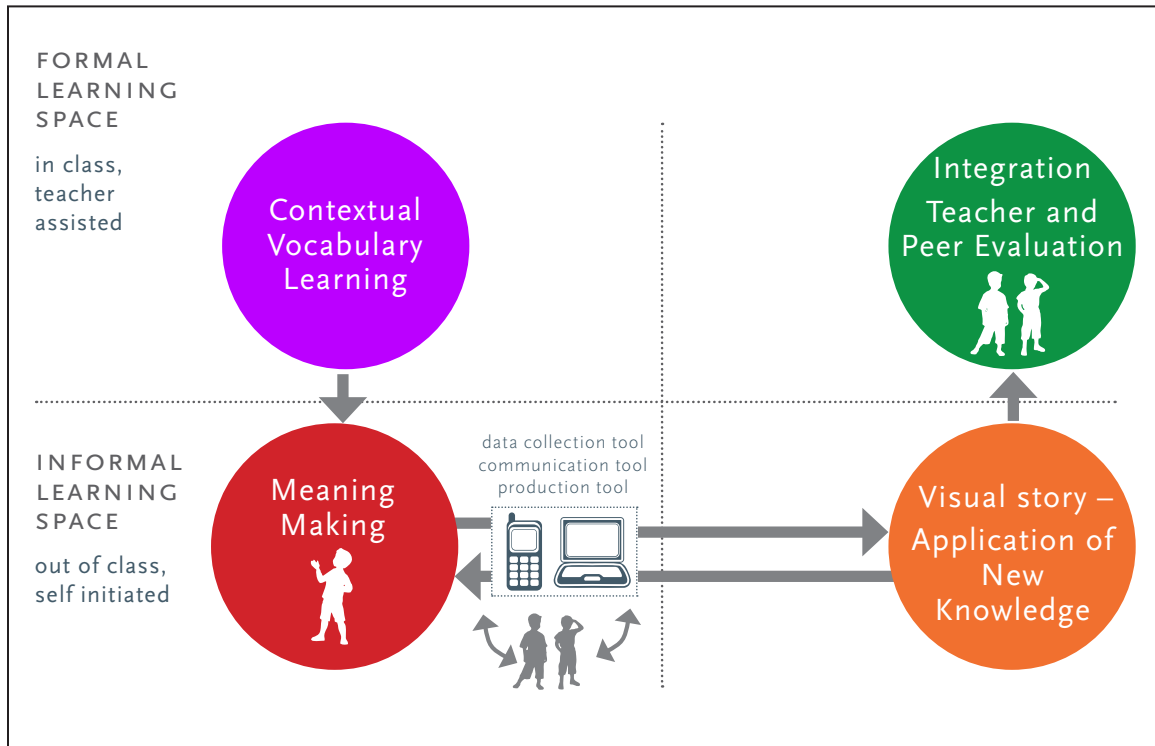


Table 4.2 Visualization of a lesson plan

visual interpretation of it, and decode another group's story. This makes part No. 3 an application of knowledge in new situations, merged analysis of the knowledge that arises through critical thinking, as per levels 3 and 4 of Bloom's taxonomy, and Kolb's Abstract Conceptualization stage (Bloom, 1965; Kolb, 1984).

The final part of the designed lesson plan is an integration of new vocabulary achieved through teacher and peer evaluation. Students are back in a formal environment – the classroom. Teacher-mediated discussion helps to identify concerns, ideas or reflections. This part would be categorised as Active Experimentation by Kolb and/or a synthesis of information gleaned through creative thinking, merged with an evaluation produced through earlier stages information, where one is involved in its judgement, as per Bloom (Bloom, 1965; Kolb, 1984).

## II OBJECTIVES

Henry Hudson Elementary School in Vancouver, BC was the research site for further user trials with grade 7 GG students. I tested three different language learning visual activity approaches. The intent was to identify the most effective way to transfer traditional language -learning into active learning. Another goal of this prototype examination was to detect any negative inclination that could manifest within the active learning principle, preventing or interfering with the language learning process itself.

I investigated the possible application of this active learning approach with the help of Mobile-Assisted Language Learning and Computer-Assisted Language Learning frameworks as interactive, communicative assisted learning solutions. These learning solutions would emphasize learner-created content, with the goal of improving the vocabulary development of grade 7 students. It is assumed that the utilization of computer and mobile technologies in correlation with an active learning method could increase the sociability dimension of learning vocabulary and provide students with an opportunity to engage in knowledge creation and sharing across formal and informal learning environments.

## III. SETTINGS

The concept proof, paper iterations, were integrated into a regular grade 7 language learning lesson, where students have traditionally been engaged in vocabulary learning through a teacher-centered, text-based method. The duration of the activity was 45 minutes. After ten minutes in

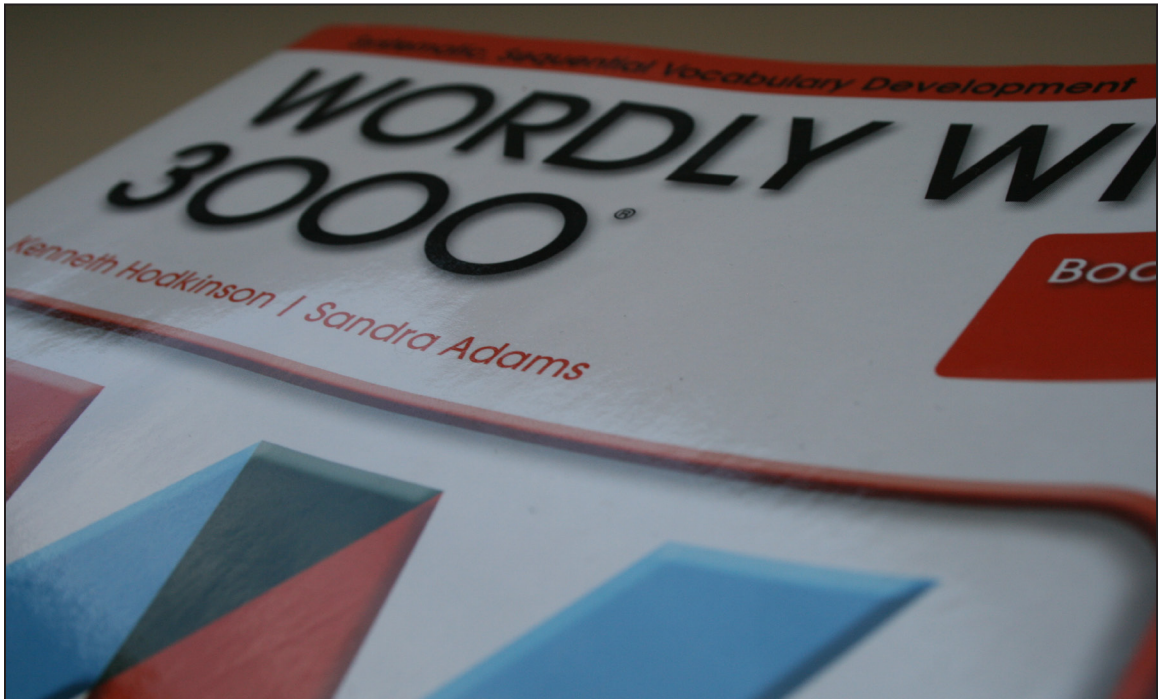


Figure 4.1 *Wordly Wise 3000* vocabulary learning book cover, grade 7. Photo by Slava Shmakin

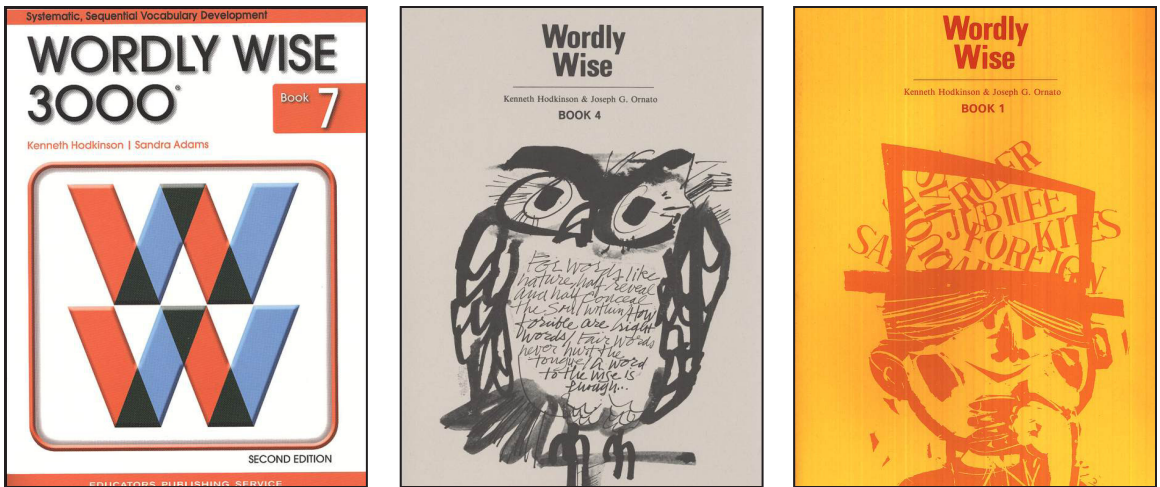


Figure 4.2 *Wordly Wise 3000* vocabulary learning book covers: grade 7, year 2009; grade 4, year 2004; grade 7, year 1997.

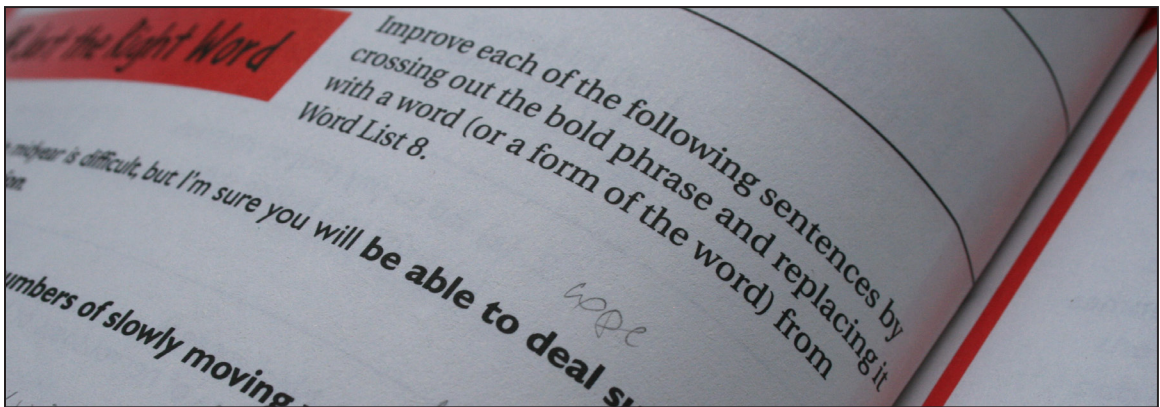
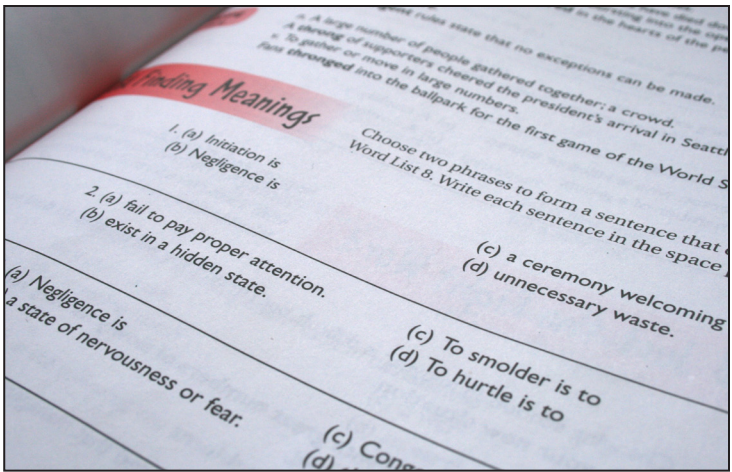
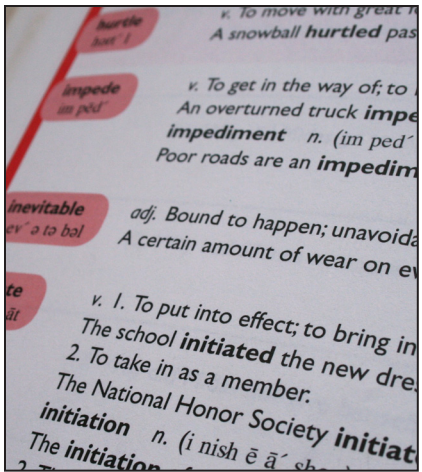
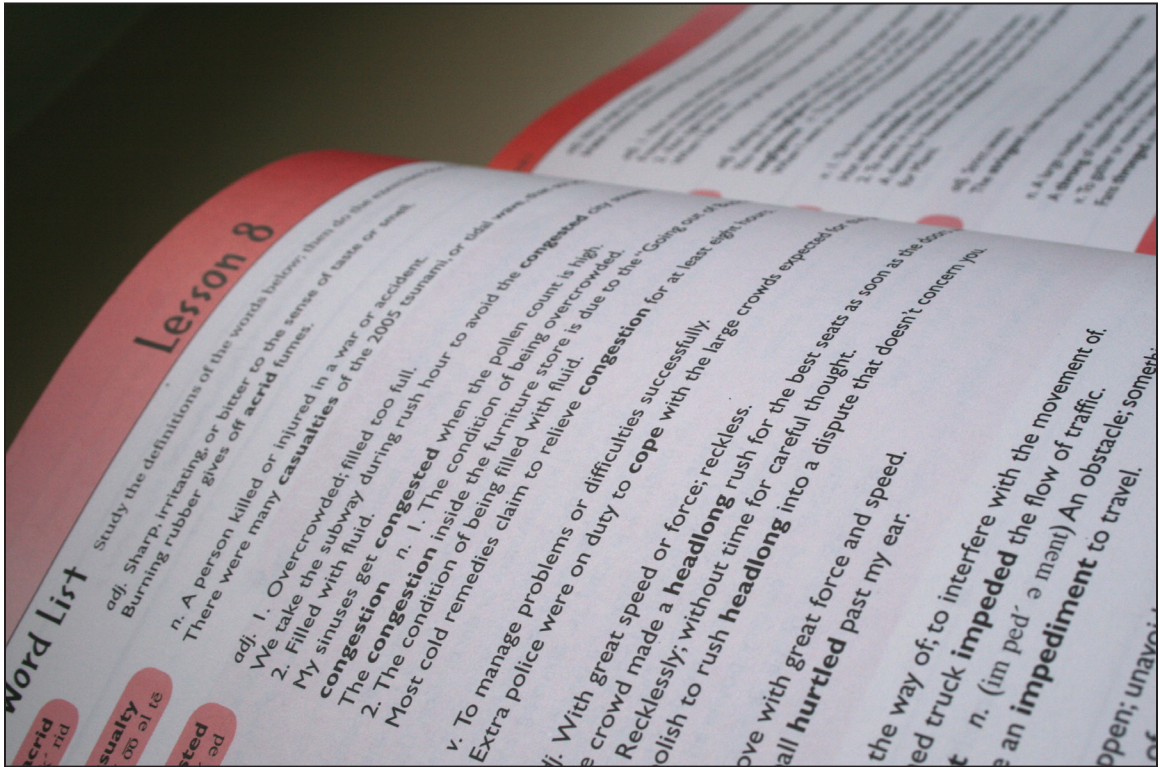


Figure 4.3 Wordly Wise 3000 vocabulary learning book, grade 7. Lesson 9.  
Photo by Slava Shmakin



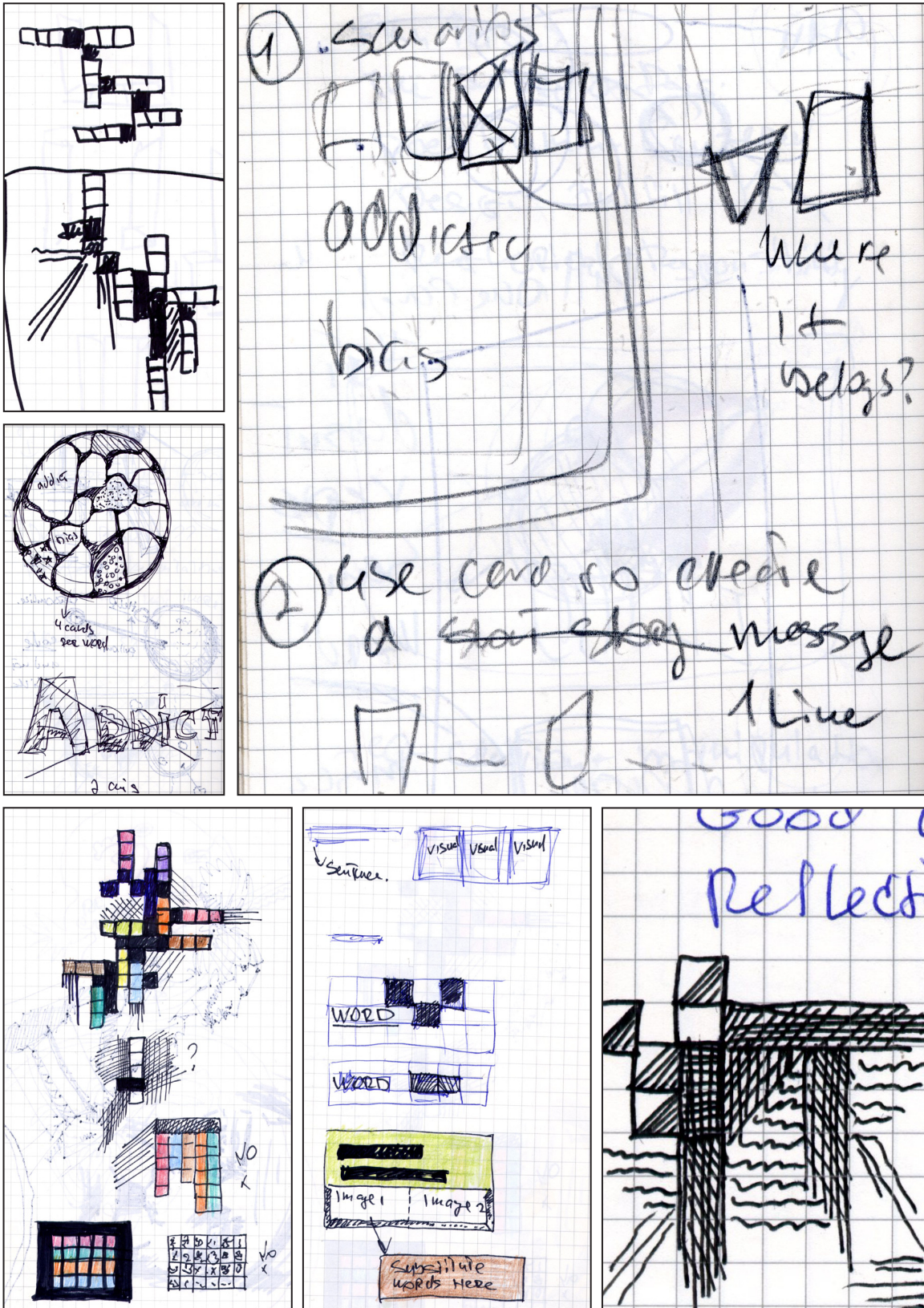


Figure 4.4 Sketches for concept proof – paper iteration. Sketches by Slava Shmakin

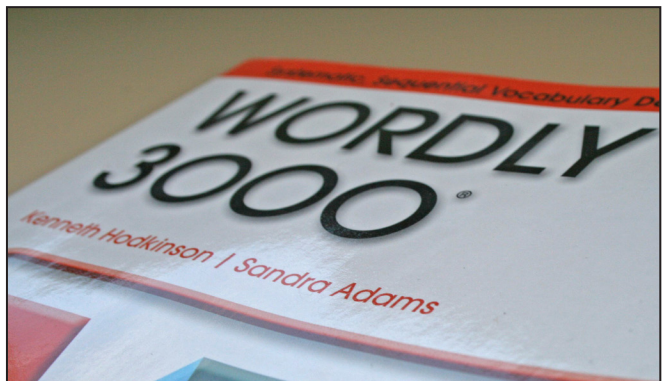
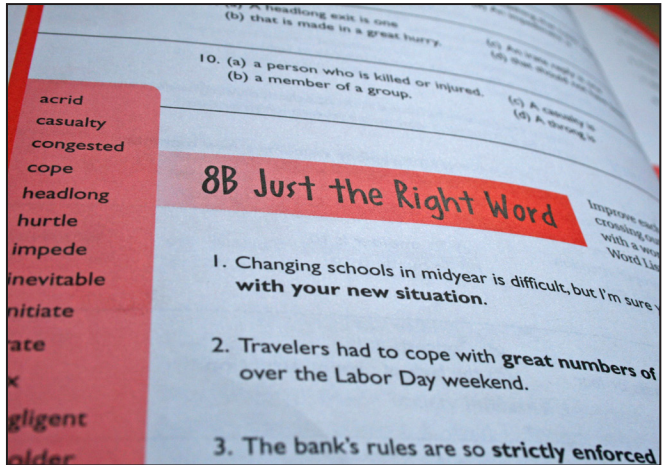
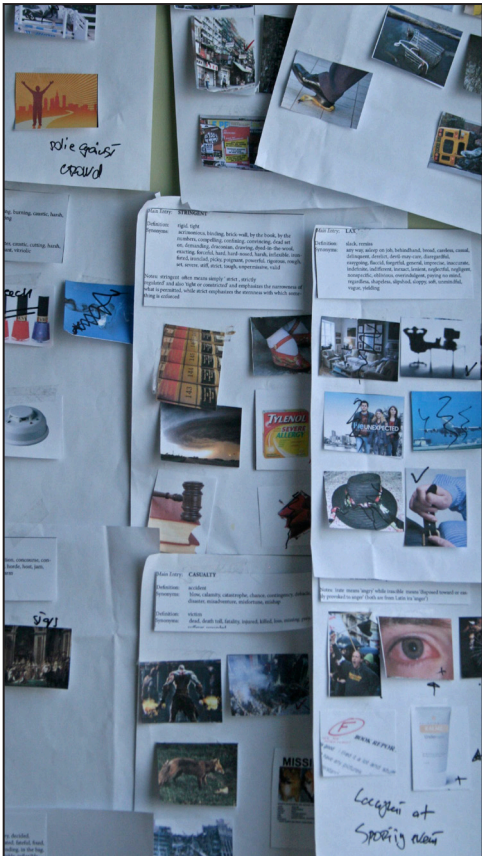


Figure 4.5 Material for concept proof, based on the *Wordy Wise 3000* text book. Activities No. 3 and 4. Photo by Slava Shmakin



Figure 4.6 Material for concept proof, based on the *Wordy Wise 3000* text book. Activity No. 3. Photo by Slava Shmakin



Figure 4.7 Material for concept proof, based on the *Wordy Wise 3000* text book. Activities No. 3 and 4. Photo by Slava Shmakin

which the teacher explained new words and their meanings (formal setting), the class was divided into groups of four. During the next twenty minutes, each group was engaged in completing the test activities, aimed at assimilating the material presented by the teacher. The groups worked on the same word list, based on the *Wordly Wise 3000* textbook (Figures 4.1, 4.2 and 4.3). However each group was made to utilise different learning approaches. This structure was intended to facilitate comparison of the results of one alongside the other to discover the most effective way to transfer traditional language learning methods into an active learning model. Such words as *acrid*, *casualty*, *congested*, *cope*, *headlong*, *hurtle*, *impede*, *inevitable*, *initiate*, *irate*, *lax*, *negligent*, *smolder*, *stringent* and *throng* were used for this activity.

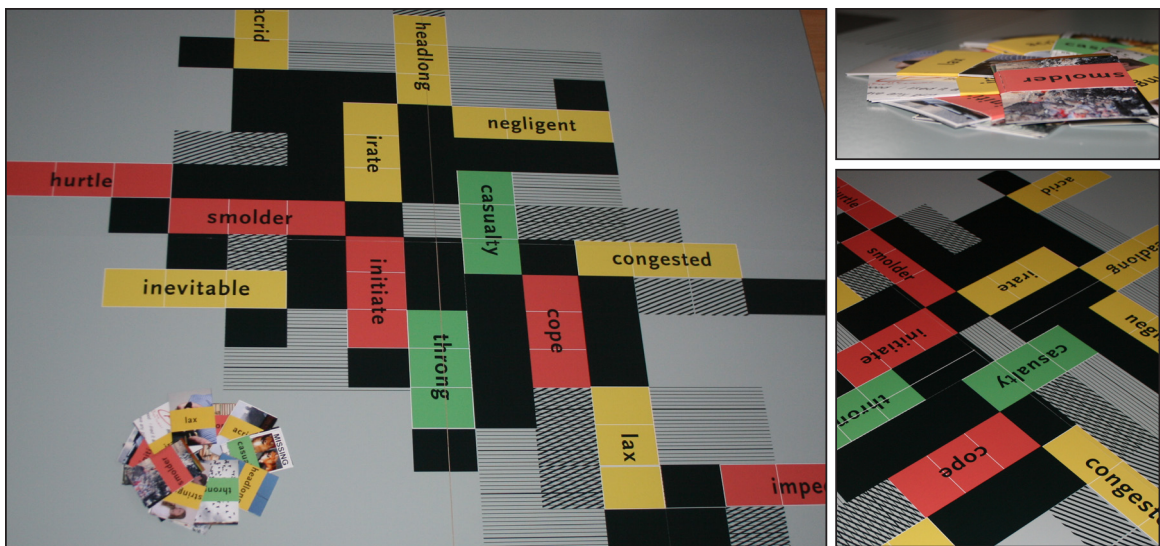


Figure 4.8 Material for concept proof, based on the *Wordly Wise 3000* text book. Activity No. 4. Photo by Slava Shmakin

Eight students from group No. 1 – “the traditional”– worked on the *Wordly Wise 3000*<sup>13</sup> textbook exercises individually, in their classroom – the formal environment (Figure 4.9). Six students from group No. 2 worked collaboratively outside of the classroom (informal environment) using still photographs and video to represent their own understanding of the words by creating visual meanings for them using images, narratives and/or scenarios (Figures 4.7 and 4.10).

Groups No. 3 and 4, each of which consisted of four students, also worked collaboratively on the visualization of the list of words according to the pictures provided to them. The words

13 *Wordly Wise 3000* textbook – traditional Language Arts vocabulary study book for grades K–12 in which students are required to “fill in” correct answers. It is written by Kenneth Hodkinson, Sandra Adams and Cheryl Dressler. Published by Educators Publishing Service, Inc and printed in two colors – red and black, this textbook consists mainly of text and some simple graphics.

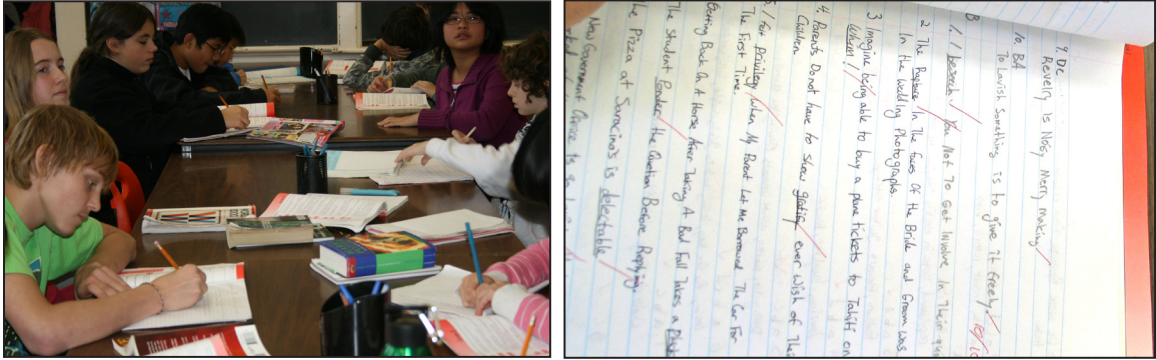


Figure 4.9 Group No. 1 – study in progress. Photo by Slava Shmakin



Figure 4.10 Group No. 2. Photo by Slava Shmakin



Figure 4.11 Group No. 3 uses the map. Photo by Slava Shmakin



Figure 4.12 Group No. 4 replaces words with images. Photo by Slava Shmakin



Figure 4.13 Group No.4 provides individual feed back. Photo by Slava Shmakin

were colour-coded as follows: green for a noun, red for a verb, yellow for an adjective and blue for an adverb. Students from these two groups participated in the selection and matching of the correct image to the correct meaning of each word by employing a visual language that was slightly different for each group. Students from group No. 3 were given a map and cards and were asked to choose three scenarios, from the group of five, to form a meaning that correctly, in their opinion, represented the word depicted on the map (Figures 4.4, 4.5 4.8 and 4.11). The next phase required that they attach the three selected cards onto the map accordingly, connecting the word to its meaning. Students from group No. 4 were also directed to use the provided card (Figures 4.6). However, this group also had to improve the sentences provided, by removing the phrases and replacing them with two scenarios, out of the group of four (Figure 4.12).

Upon completion of the activities, all students provided individual feedback by answering four questions. Groups No. 2, 3 and 4 answered an identical set of questions, while group No. 1 had a set of different questions (Figure 4.13). Questions for group No.1 included the following: *Please describe your feelings towards text book learning? What do you like about text book learning? What do you dislike? If you could make changes to your text book learning, what types of changes would you make? Please describe.*

The questions for the other three Groups included: *What did you learn from your prescribed activity today? Please describe. Do you think this experience might help you in learning language? Do you feel this activity increased, or decreased, your ability to apply meaning to words?*

#### IV. CONCLUSIONS

After comparing the results at the end of the class's experimental test activities, I found that, two students from "the traditional" group No. 1 could not fully complete their exercises within the 20 minutes allotted, and three students from that group selected incorrect answers. Out of a total of 8 students, five required the teacher's assistance. The students participating in the experimental activities accomplished their tasks ahead of time and had answered every question correctly. Students enjoyed the active learning exercises and expressed a desire to do them again, claiming verbally and in their questionnaires to having attained a better understanding of the meaning of the words on the list and the application of vocabulary in everyday life settings.

In Groups No. 3 and No. 4, the students got engaged in debates concerning cultural and political meanings, while selecting the appropriate card scenario to represent a particular word. The learning activity designed for group No. 3 proved to be more ambiguous, which therefore



added another level of challenge, than that of group No. 4. As a result, group No. 3 were more engaged with the material producing a more significant learning outcome than that of No. 4.

Group No.2 had initial difficulties with their digital equipment, which took their attention away from the activity itself. They also had attempted to create images that were not relevant to the task. Upon being redirected, the group aborted random play with the equipment and focused on the learning process. All the students expressed a great deal of motivation, creativity and understanding of the study material. They suggested that the process of creating their own scenarios with the equipment and materials resulted in a much deeper understanding of the words, as it made them actively apply vocabulary to new situations.

The eight students from Group No. 1 expressed positive feelings towards text books in general, but on the follow-up questionnaire, each one of them answered “boring” to the question “*Please describe your feelings towards text book learning?*” Most of them answered “nothing” to the question “*What do you like about text book learning?*”, but they acknowledged the historical significance of traditional text book learning. The students also commented on the repetitive approach used in the textbook learning method. The students reported a lack of motivation for this method. They speculated that an active and engaged learning system could potentially help them understand the reason for studying complex words. Some students expressed a desire to see more engaging examples of where this complex vocabulary could be used. For questionnaires results see tables 4.3.a, 4.3.b, 4.3.c.

## **c. Prototype Visualization**

### **I. INTRODUCTION**

The analysis of the concept proof resulted in re-framing the problem space again. From the student’s own feedback, it was evident that in order to solve the problem, a strong transition from an existing situation – traditional learning – to a desired one – learning by doing – had to take place. For me to aid in this transition as a designer, I had to create an inventive concept for the design of the Language Learning Activity Paradigm prototype (LLAP).

In addressing the Kuhnian<sup>14</sup> perspective in design, Crilly (2010) highlights two categories of design. One is “routine” and the other is “inventive”. What signifies their difference is the

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14 Thomas Samuel Kuhn – an American physicist who argued that science does not advance as a linear collection of new knowledge, but rather participates in occasional changes also called “paradigm shifts”.

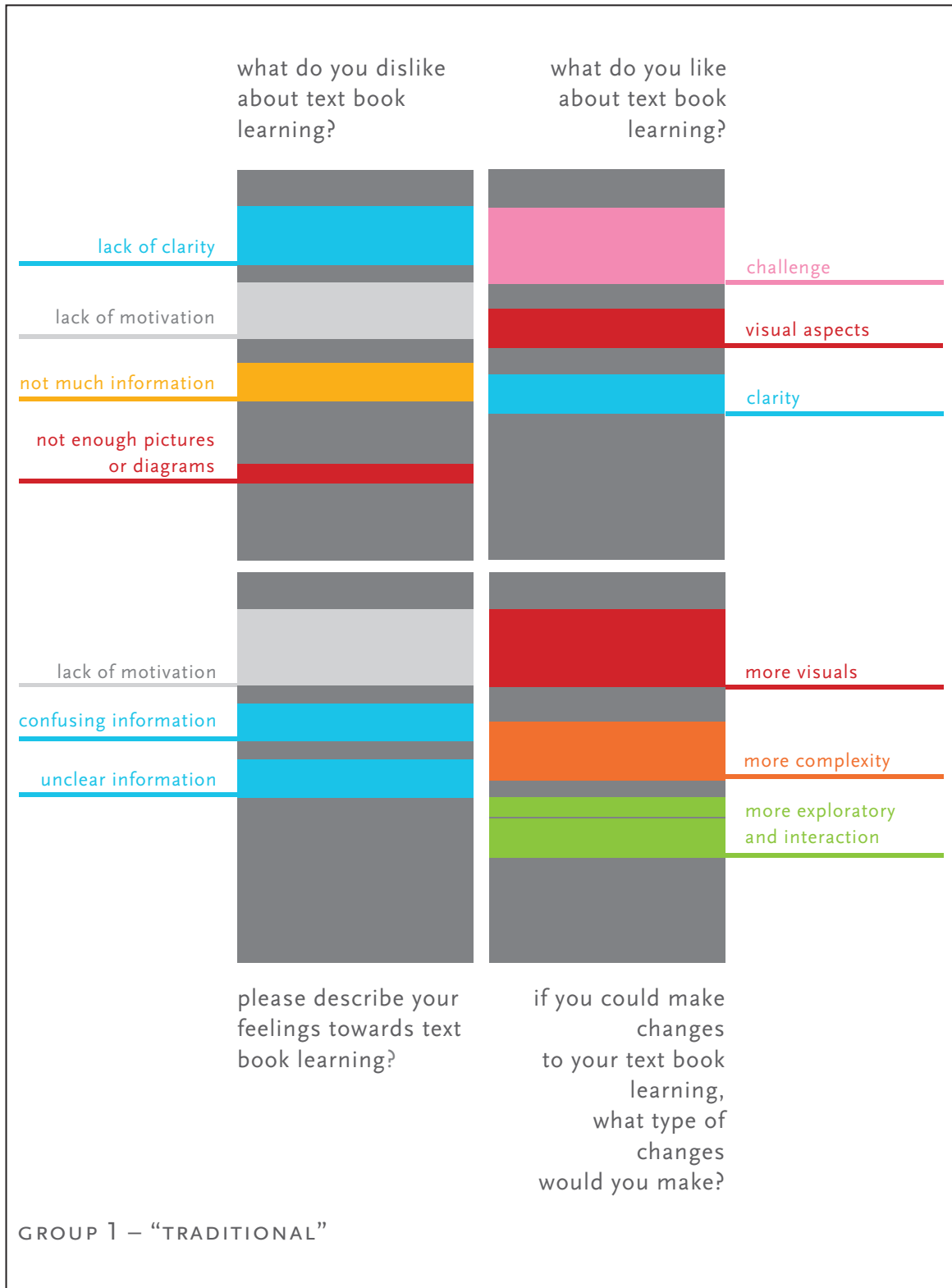


Table 4.3.a Questionnaire results graph

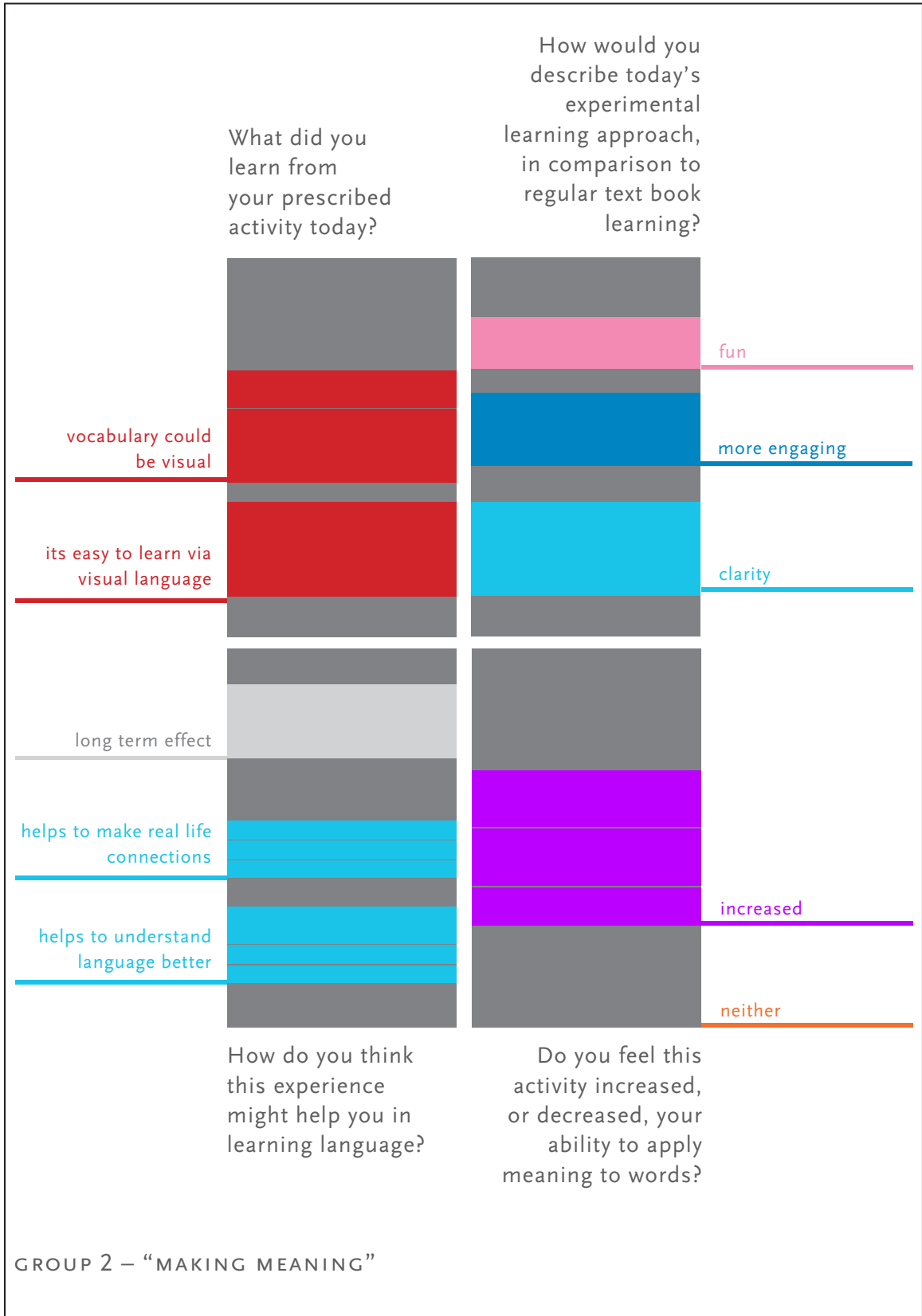


Table 4.3.b Questionnaire results graph

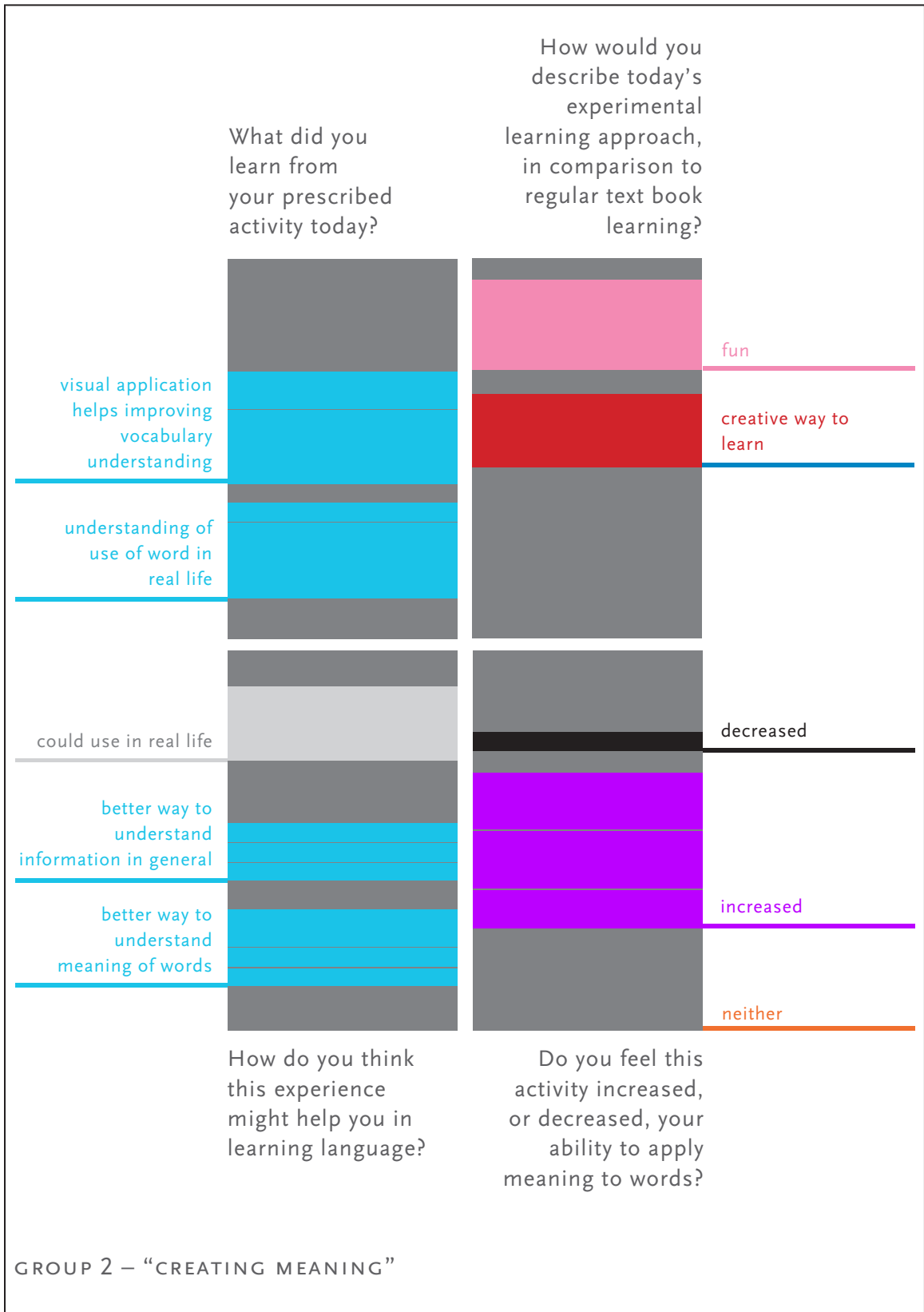


Table 4.5.c Questionnaire results graph

fact that “routine design operates within an existing paradigm”, while “inventive design involves establishing a new form of artifact, or a new approach to the creation of artifacts” (Crilly, 2010, p. 60). An inventive design produces an innovative method, which replaces a traditional one. (Crilly, 2010). In visualizing the Language Learning Activity Paradigm, I attempted to develop an innovative concept “in the hope of developing that concept into a more effective solution to the problem” of an outdated learning system, thereby creating a new method for learning language (Crilly, 2010, p. 62).

I approached the visualization of the Language Learning Activity Paradigm only after first understanding the inherent problems of the current system. I examined “‘what needs to be done’ with respect to social aspects”, since “(the) design project not only is a plan or willingness to act; it is the action to project oneself” (Narvaez, 2005). I addressed the aspect of “what needs to be done” by composing a lesson plan that could be accessed via software embedded into a web site, where students could get instructions on active lessons, upload media files, create their own files, interact with each other, customize their settings, get access to the Internet and participate in a visual narrative (part No. 3 of the lesson plan).

The Paradigm is the culmination of the research presented in this paper, to which rigorous design research methodology was applied. The Language Learning Activity Paradigm functions as a visual synthesis of product research, cultural probing, participatory design, user trials, and theoretical framework implementation, posited by learning theorists all triangulated as part of the data analysis. It signifies that the design process is “... always about synthesis – synthesis of market needs, technology needs, and business needs” (Kolko, 2010, p. 15) .

My praxis for design thinking, as defined by Pacione (2000), suggests a circularity in the processes of “looking” and “making”. That is: looking for new design solutions by employing different research techniques such as cultural probes and participatory design; and creating visual systems as a response to research. This means constantly moving between these two processes, through trial and error, and discovering the best applicable solution.

## I. DESIGN ITERATION

The creation of a new language learning method involved establishing a level of ambiguity. The decision to create a visually ambiguous environment was drawn from the results of the cultural probes, which indicated that the students needed to participate in a complex and challenging language learning system in an open ended way. Ambiguity has its own benefits, when it comes

to design, since “it allows designers to engage users with issues without constraining how they respond”. Also, “it allows the designer’s point of view to be expressed while enabling users of different sociocultural backgrounds to find their own interpretations” (Gaver, Beaver, and Benford, 2000, n.p). Ambiguity in visualization is also important because it forces the user to partake in a meaning-making process.

To construct a visually and emotionally ambiguous Language Learning Activity Paradigm product, I derived my inspiration from Wassily Kandinsky’s paintings, Char Davies’s visual approaches to virtual reality, Oliver Byrne’s description of complex information with color in *The Elements Of Euclid*, and Stephen Wolfram’s theories on complexity emerging from a simple rule which exists in nature.

As a segment of the paradigm lesson plan to help students learn better and understand vocabulary within the visual system, I examined Wassily Kandinsky’s *Triangle, Square, Circle: A Psychological Test* from the 1920s (Table 4.14). The artists’ experiment was aimed at discovering a universal correspondence between form and colour. Though it provided intriguing results, it was somewhat dismissed by critics in terms of the validity of such a universal correspondence. Yet his attempt to establish a type of visual grammar inspired my initial experiments in developing a universal structure for visual grammar.

During this process, I also experimented with the illustrating principle of Oliver Byrne’s *The Elements Of Euclid* (Tables 4.15 and 4.17), wherein he described complex information with colour. Analysing how many different combinations could be derived from a simple segmented form by using different colours and arrangements, I applied a deductive reasoning to generalize results by combining and recombining samples to identify casual relations between the variables.

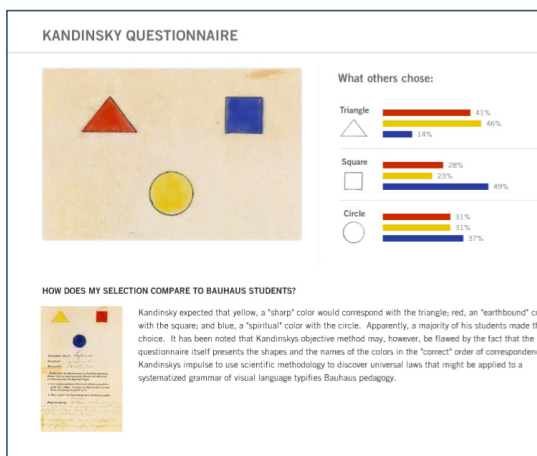


Figure 4.14 Wassily Kandinsky. *Triangle, Square, Circle: A Psychological Test*. 1920

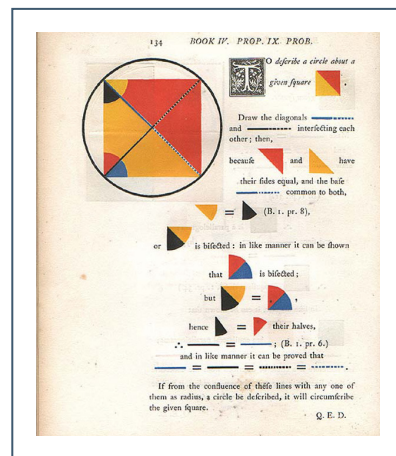


Figure 4.15 Oliver Byrne. *The Elements Of Euclid*. 1847



Figure 4.16 Color Study. Watercolors. Artwork by Slava Shmakin

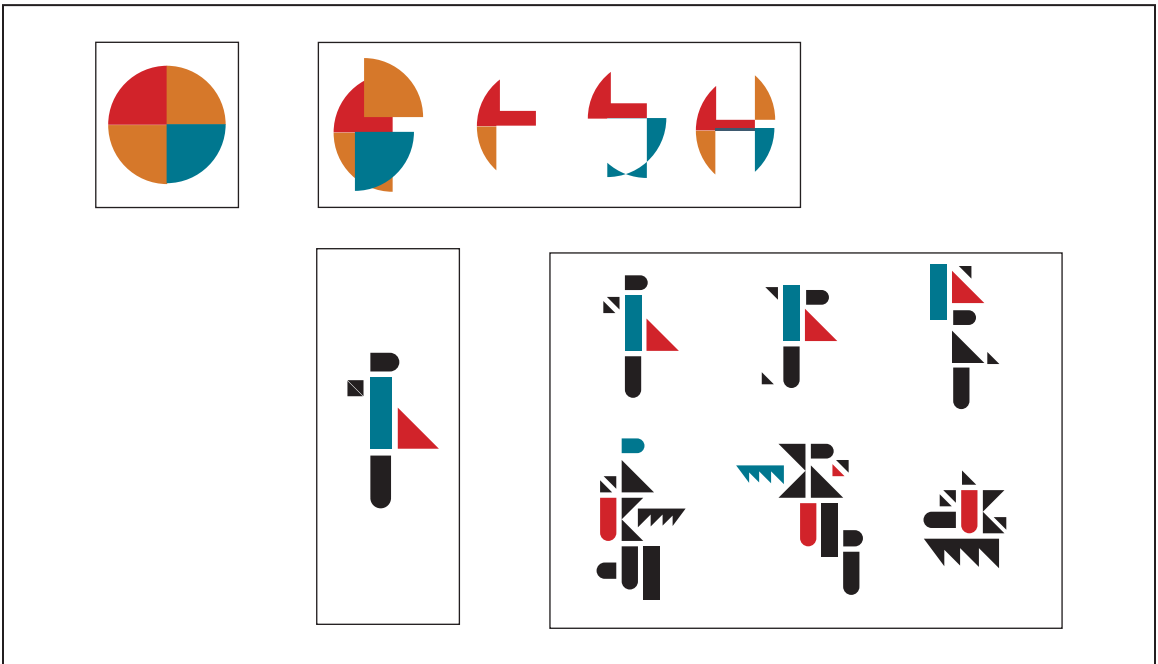


Figure 4.17 Study on variation and meaning. Digital artwork by Slava Shmakin

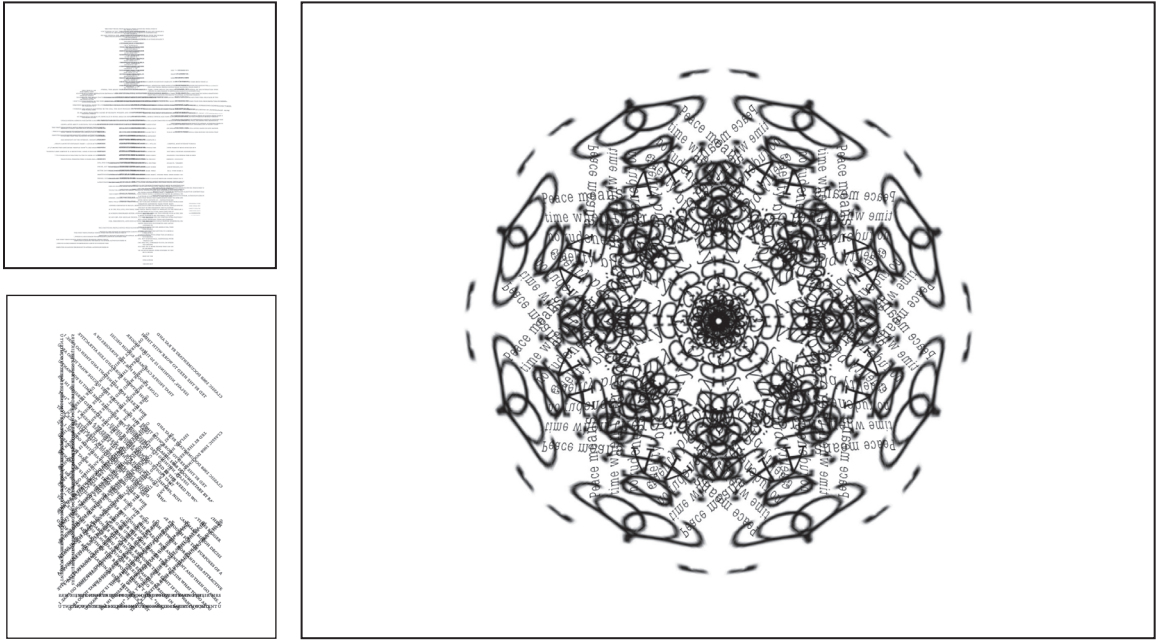


Figure 4.18 Study on complexity and simplicity. Inspired by Stephen Wolfram's patterns and ideas. Digital artwork by Slava Shmakin

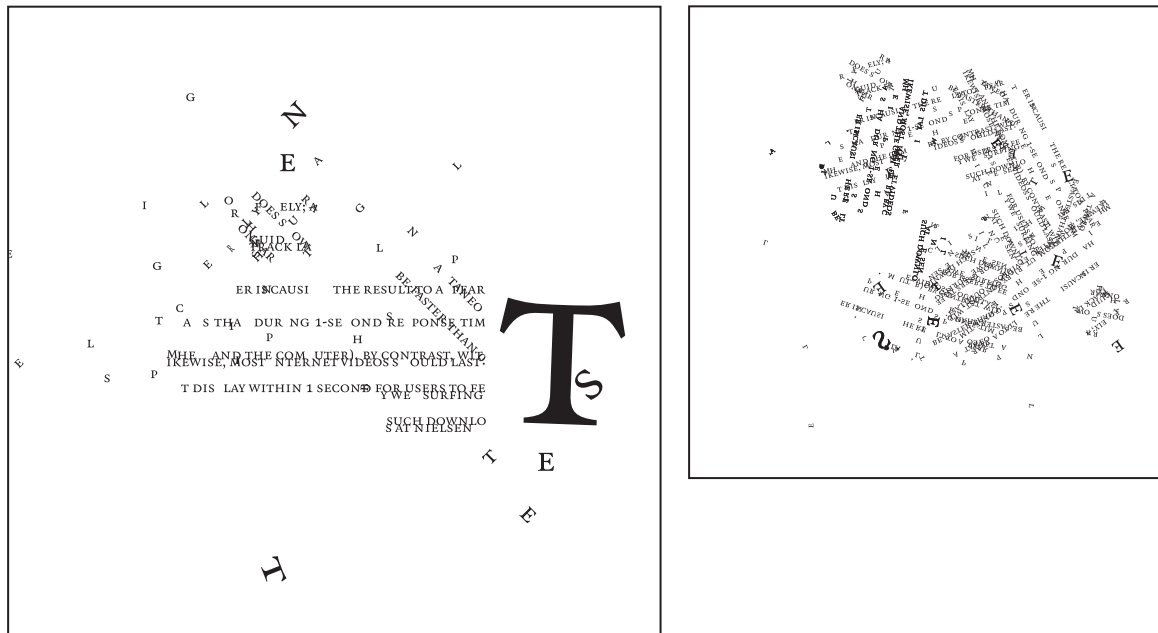


Figure 4.19 Study on complexity and simplicity. Inspired by Stephen Wolfram's patterns and ideas. Digital artwork by Slava Shmakin



These “Byrne” experiments in combination with the Kandinsky inspired experiments, eventually led me to Stephen Wolfram’s theories of complex patterns derived from simple rules which could be seen in Tables 4.18 and 4.19. I attempted to define how one can create a visual code by applying a simple approach, which could then easily be decoded.

After unsuccessful attempts at developing a universal structure, because of the rapidly growing complexity of the concept and lack of a clear rationale for this type of visual grammar, I decided instead to support the prototype’s concept by producing visually rich designs, inspired by Kandinsky’s visual language. The initial idea of developing a language of colour to signify nouns, adjectives, verbs and adverbs, which was originally used in my hypothesis proof, was also abandoned since it did not add any significant value to the overall concept.

My original design, which was essentially influenced by Kandinsky’s paintings (Tables 4.20 and 4.21), and the circular forms found in the students’ cultural probes, proved to be too difficult to navigate for the students (Tables 4.22 and 4.23). A variety of potentially interactive features distracted the students (Table 4.24). They could not complete basic tasks due to the abstract connotation of the design and the lack of clarity. It was apparent that the design defeated the purpose of the prototype’s functionality, and for this reason I began to reconsider my whole visual approach.

Speaking of “paradox in the connotations in ‘experience design’”, McCullough (2005) argues that “a designed experience can alter a perception rather than accomplish a task, the experience design movement emphasizes satisfaction” (p. 161). He further states that the concept of satisfaction is not just a mere accommodation of anticipation, but also the ability to modify satisfaction as well. During my initial test, students validated McCullough’s description of design experience and produced satisfaction by being engaged with the initial visualization of the prototype. However, the prototype failed to meet learning expectations of the completed language learning tasks.

In the second generation prototype I concentrated on containing the LLAP’s exploratory factor to sustain the designed experience that was achieved in the first iteration of visualizations, while keeping it familiar for students (Tables 4.25 –4.30). Legibility and clear navigation were fundamental criteria for both the interface design and the learning activity. At this stage, I decided to follow the Forlizzi and Battarbee (2004) suggestion, stating “users need to attain fluency with the product early on, to ensure that they will continue to use the product and not abandon it in frustration. This means that minimal time can be invested in learning the basic controls, and that use should be rewarding from the start” (p. 265).



Figure 4.20 Wassily Kandinsky. *Painting with Three Spots*. 1914. Oil on canvas, 120x111 cm, Madrid. Collection Thyssen-Bornemisiz



Figure 4.21 Wassily Kandinsky. *Red spot II*. 1921. Oil on canvas. 131x181 cm, Munich, Stadtische Galerie, Germany

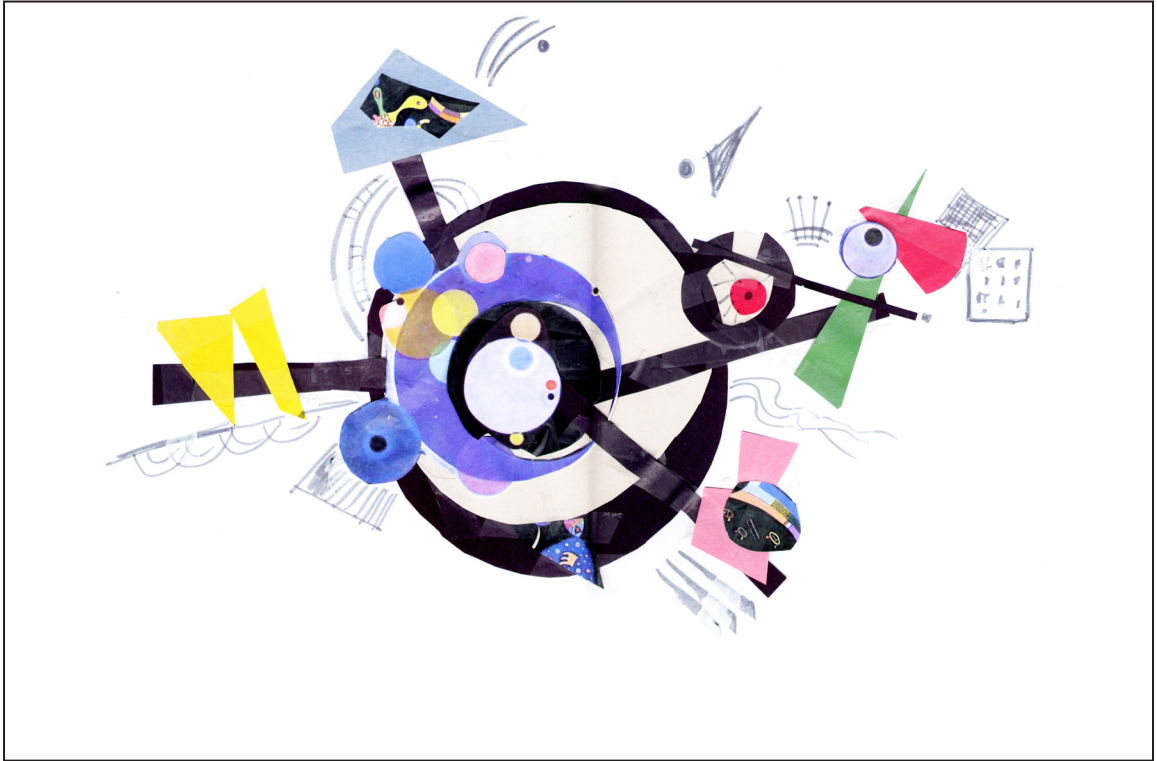


Figure 4.22 Original sketches for the Paradigm. Colored paper, ink. By Slava Shmakin

My second generation of visualizations were extremely simplified to achieve “users fluency”, and as a result, moved further away from Kandinsky’s work. Tests of these designs showed that students lacked interest in the newly created environment. They commented that some of the key factors, such as ambiguity and emotional impact, were no longer present, or insignificantly present, in the new Paradigm visualization. I decided to revive the original aspects of complexity, exploration and emotion, but in a visual way that provided legibility, clear navigation and familiarity with the explored environment.

An ambiguous system has the capability of carrying an emotional impact and creating expressive user-product interaction. It was evident that emotion “shapes the gap that exists between people and products in the world” and that it also provides the ability to “understand (ing) and communicate (ing) about what we experience” (Forlizzi and Battarbee 200, p. 261). Forlizzi and Battarbee go further by suggesting that “emotion affects how we plan to interact with products, how we actually interact with products, and the perceptions and outcomes that surround those interactions” (Forlizzi and Battarbee 2004, p. 265). I aimed to create the LLAP prototype as an emotional learning environment, allowing students to change and modify their space, in order to provide a catalyst for communicating and understanding. In order to achieve this task, I decided to involve a focus group of students to help me design the prototype, as opposed to merely consulting them at the testing stage.

Pacione (2010), quoting Pink (2006) on human-centered design, states that “today we must all be designers” (n.p). He also supports his statement by referring to a speech by President Obama, in which he advocated youth not to be passive consumers, but instead active makers of their own things (Pacione, 2010). My decision to involve students in the process of designing the learning environment also echoes Tim Brown’s<sup>15</sup> statement that “design is too important to be left to designers” (Pacione, 2010). Collaborative design, as in co-design, “means finding ways to share a vision of a system among all its actors and stakeholders as the system evolves” (Thackara, 2005).

The third generation of the design iteration was produced by seven students from my focus group, who were asked to represent visually, in a non-verbal format, images that reflected their visual understanding of learning the English language, such as reading, viewing, and writing. Students chose colours and played an active role in the final layout and composition of the LLAP interface, and the result clearly displayed that the ambiguity, towards which the Google

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15 Tim Brown, CEO and president of IDEO, which is a design and consultancy agency founded in Palo Alto, California, United States.



Figure 4.23 First generation prototype sketches for the LLAP. Storyboards. Mixed media.  
By Slava Shmakin

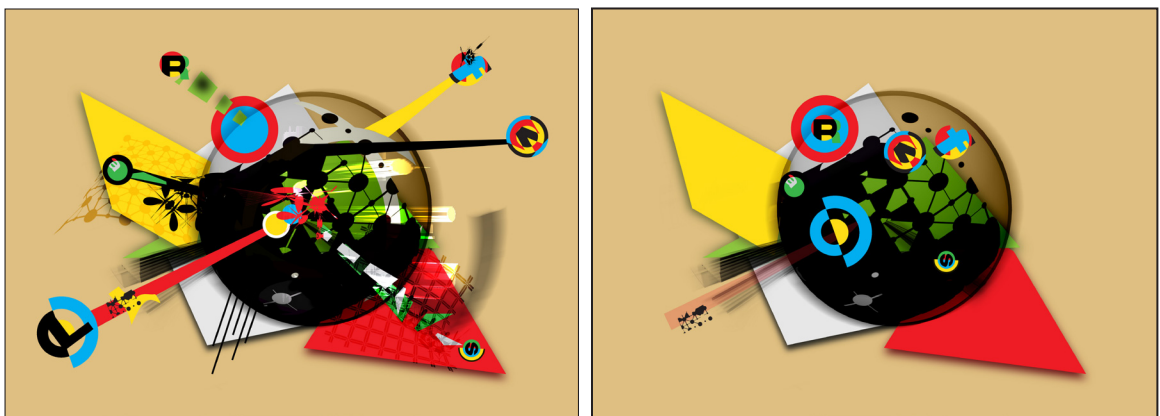


Figure 4.24 First generation prototype sketches for the LLAP – “Home” page animation.  
Digital artwork. By Slava Shmakin

Generation is thought to be inclined, was evident. Students enjoyed creating complex shapes and had many discussions regarding the best way to represent their learning environment. In such discussions, my function varied from mediator to designer, where I tried to help students constitute their various ideas. Students decided to have a strong looking, complex interface, which they could potentially explore and adjust according to their own preferences. After long speculation on the colour scheme of the interface, students collectively agreed on not using pinks, magentas, greys or blues, but rather utilize a more mature palette, such as olive green, yellow, orange and some red. They clearly expressed the desire to be understood as grown up individuals, capable of complex emotional and visual expression.

The focus groups decided that having less options within the interface was more beneficial for the purpose of navigation. They suggested having only necessary options, such as: "Internet", which would be a link to the internet; "Messages", which would be a message board similar to that of the Facebook wall idea, where students could post notes to each other, to their teachers and to other teams; and "Personal", as being able to personalize preferences of the LLAP also proved to be of high importance for the students. Working with students, and using familiar elements for navigation and recognizable web site structure, I constructed an emotional and personalized experience, aimed at creating a product that is easily "adaptable, learnable, and usable" (Forlizzi, and Battarbee, 2004, p. 264).

Potentially, this prototype affords students with the opportunity of building their own environment with the LLAP, in a collaborative team-like manner, "thinking in images" while assigning customized functions to their designed elements (Barnett, 2009). For the purpose of this project, I constructed the visual environment using the students' designed elements and feedback from the cultural probes.

I also referenced Char Davies's virtual spaces, and her *Osmose* and *Ephémère* works, in which the concept of navigation and real time three dimensional interaction with overlaying code and visual complexity provides a strong foundation for developing a visual vocabulary attuned to the contemporary tween's learning preferences (Davies, 2004). The idea of constructing a visual narrative was partially attained from the concept proof – paper iteration activity (groups No. 3 and 4) and Davies' "experience of being in the world" of virtual environments (Table 4.31).

Students, as part of the Lessons section of the LLAP, were asked to create their own "experience of being in the world" by developing a visual representation of a narrative, written by them, based on a prior in-class vocabulary study that was followed up by an active exploration outside of the class. Students then gathered images and movies they had produced and placed them in a

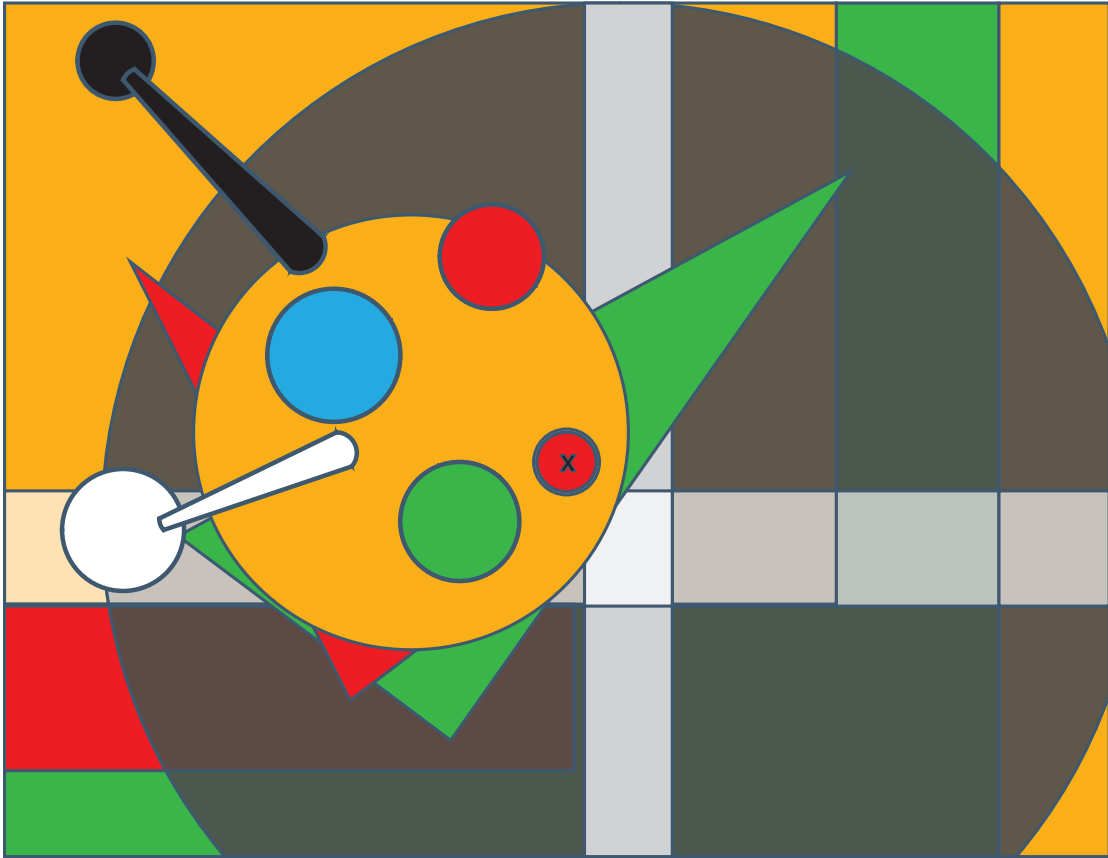


Figure 4.25 Second generation of LLAP visualization – “Home” page.  
By Slava Shmakin



Figure 4.26 Second generation of LLAP visualization – “Lesson 9” interface.  
By Slava Shmakin

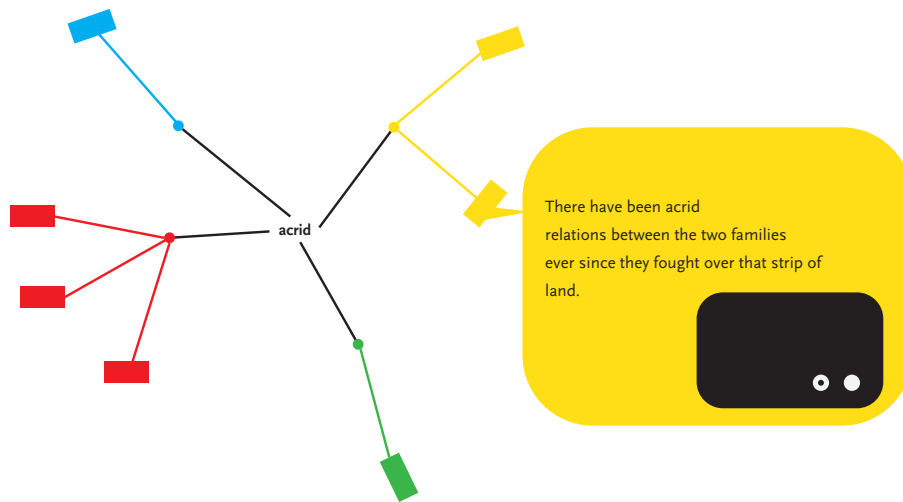


Figure 4.27 Second generation of LLAP visualization – mechanics and animation.  
By Slava Shmakin



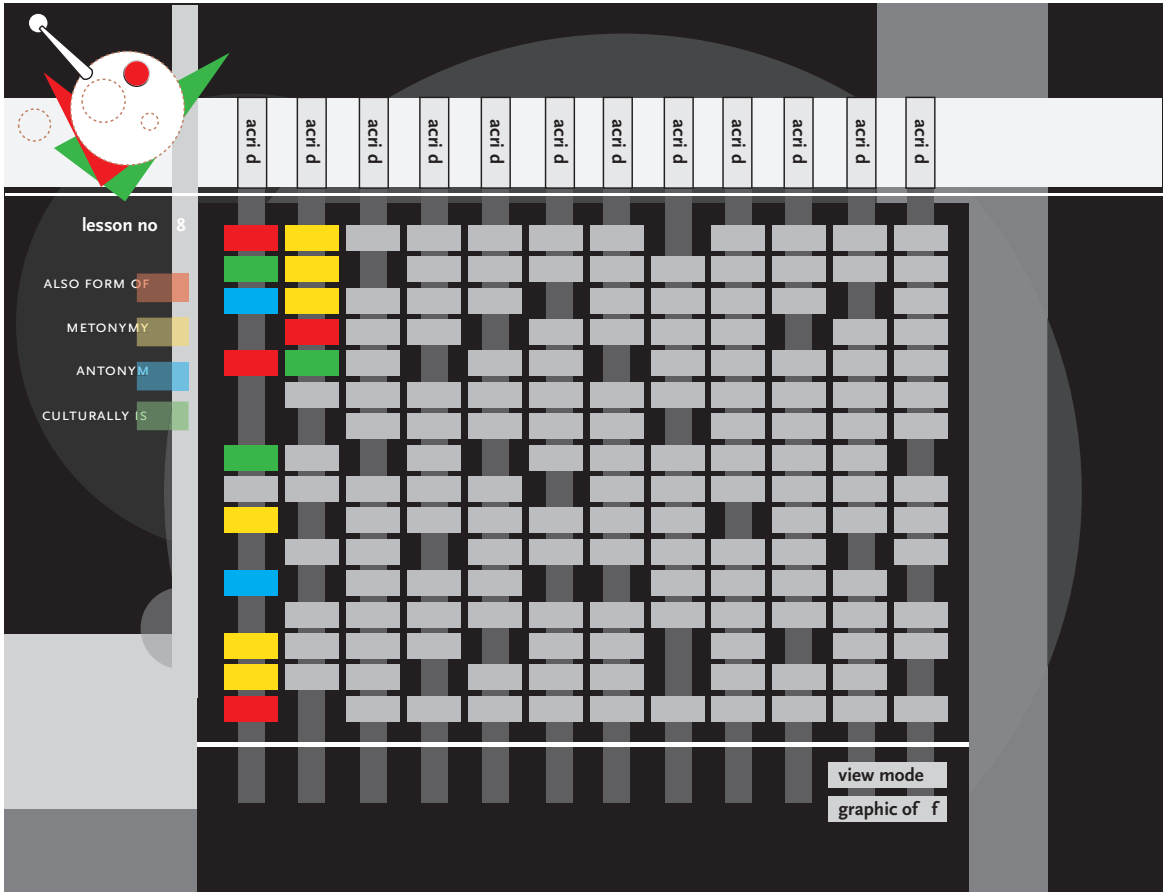


Figure 4.28 Second generation of LLAP visualization – colour tryouts.  
By Slava Shmakin

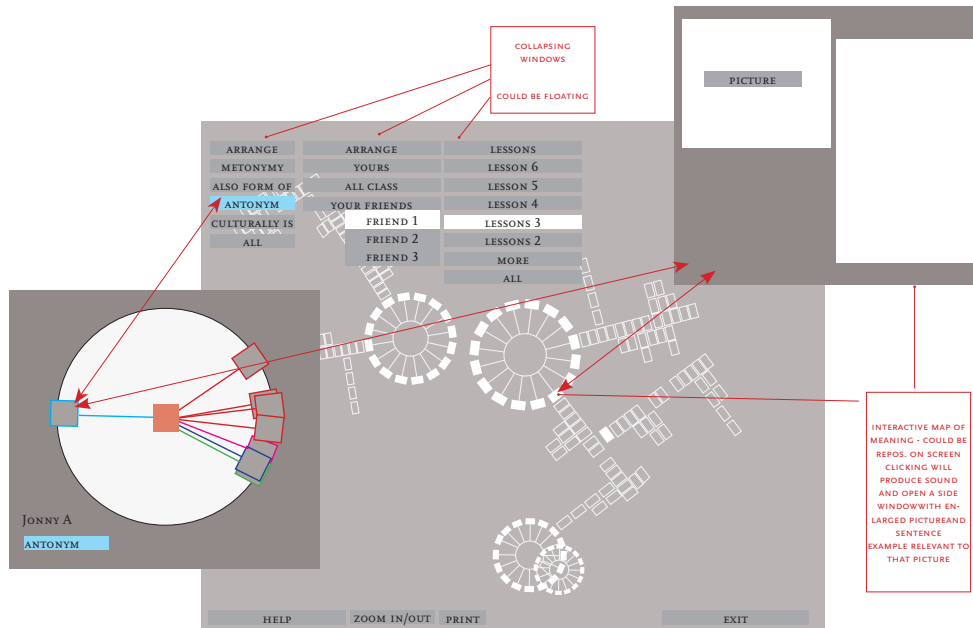


Figure 4.29 Second generation of LLAP visualization – “Lesson 9” schematics.  
By Slava Shmakin

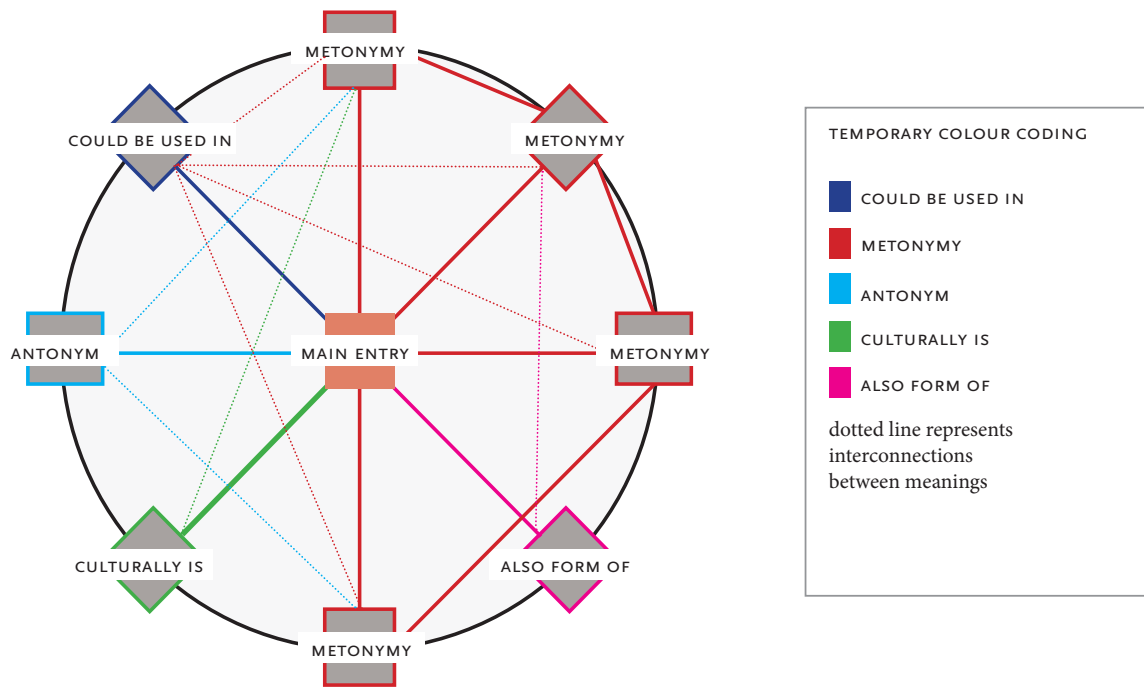


Figure 4.30 Second generation of LLAP visualization – “Lesson 9” mechanics, different option. By Slava Shmakin



Figure 4.31 Char Davies, *Osmose*.  
*Virtual Space. Space: In Science, Art and Society*.  
<http://www.immersence.com/publications/2003/2003-OGrau.html>

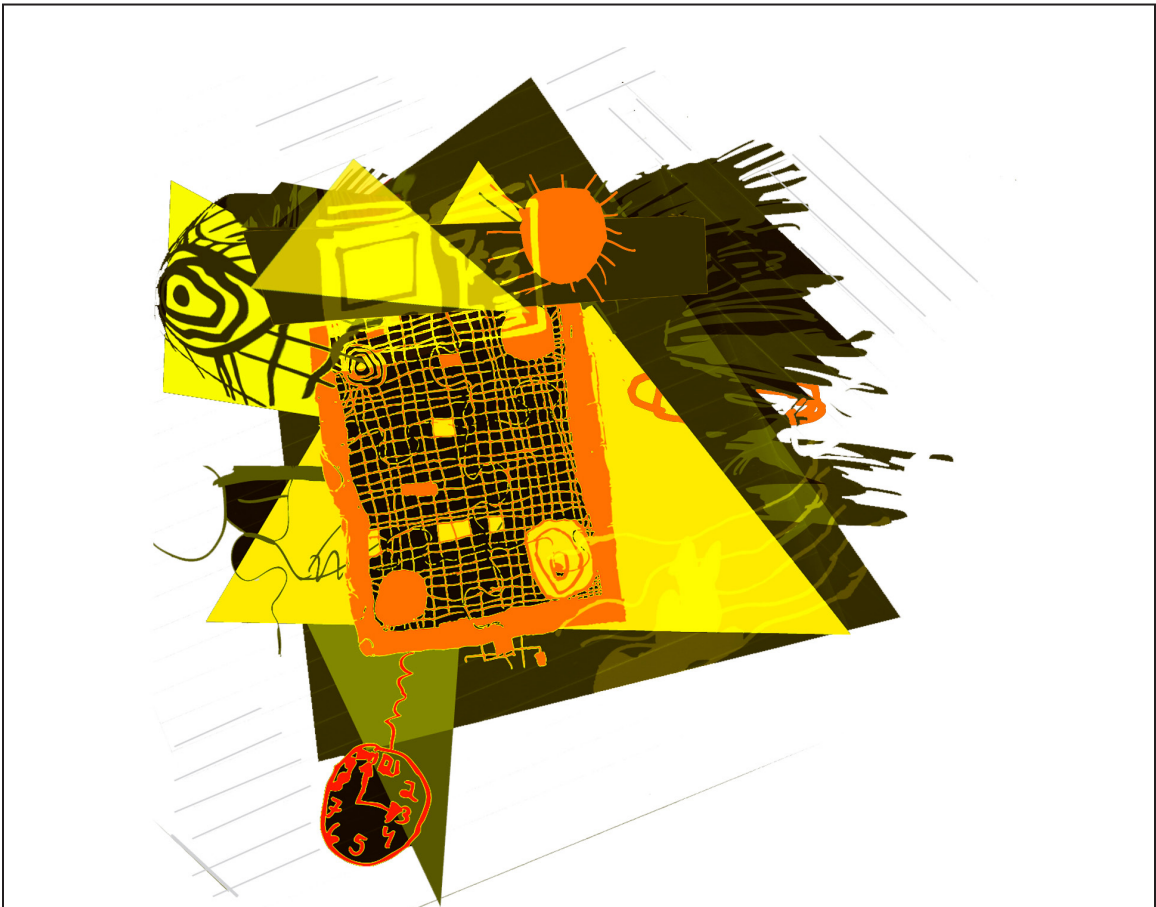


Figure 4.32 Language Learning Activity Paradigm, final visualization – “Sign In” page.  
By Slava Shmakin



Figure 4.33 Language Learning Activity Paradigm, final visualization – “Home” page.  
By Slava Shmakin



Figure 4.34 Language Learning Activity Paradigm, final visualization – “Lessons” menu. By Slava Shmakin



Figure 4.35 Language Learning Activity Paradigm, final design – “Lesson 9” visual story interface.  
By Slava Shmakin



Figure 4.36 Language Learning Activity Paradigm, final design – “Lesson 9” visual story interface.  
Picture zoom in. By Slava Shmakin

folder that was accessible within their own “Lessons” section. They could also create graphic work and hyperlinks. The system was designed with collaboration tools for sharing work and decoding the narrative. All the students could then amalgamate their contributions into a non-linear visual narrative viewable as a collective work by all the teams, or as a series of separate narratives.

Upon testing my third, and final, generation of visualizations, students were finding the LLAP more functional, engaging and easier to navigate (Tables 4.32 – 4.36). The visual language was consistent, attractive and influenced by students’ designs. Most of the students were able to accomplish the tasks, such as participating in the visual narrative from the lessons section, and experienced few complications navigating the Language Learning Activity Paradigm. Students appeared immersed and interested in exploring it. The visual narrative task, although challenging for the students to complete, produced a collaborative and engaging activity, in which students discussed cultural and social connotations of words and related appropriate images to them.

I received helpful feedback from students and adjusted the Language Learning Activity Paradigm accordingly, modifying typefaces along with their size and colour. I narrowed the number of options on the *Home Page* down to *Lessons*, *Personal*, *Messages*, *Internet*, and *Help*. The lessons section also required modification to reduce the available options, and maintain a more homogeneous visual language and colour scheme. If there was more time permitting, I would have evolved the interface further, allowing students to utilize speaking, listening, reading, viewing, representing and writing all together, which would provide them with even more opportunities for personal development and reflection of their learning environment.

## **5. CONCLUSION**

The Language Learning Activity Paradigm evolved into a visual environment as much as a product representing the summation of my investigation of the applications for active learning, with the help of CALL and MALL frameworks and blended learning environments. It became an interactive learning solution that emphasized learner-created content while serving to improve the vocabulary development of grade 7 students. The Language Learning Activity Paradigm concept prototype demonstrated that the translation of a lesson plan into a paradigm of active learning, increases situated understanding by creating a more porous and malleable language learning model for the Google Generation.

This prototype serves to support the findings of the thesis essay by demonstrating the

possible learning benefits to 7th grade students. The LLAP as an alternative learning environment proved to be more appropriate for the GG who have co-evolved with technology, and who have in turn developed different thinking patterns from those of previous generations.

Through user trials I was able to achieve validity and verify that The Language Learning Activity Paradigm learning ecology is capable of keeping students engaged with the learning material. The Language Learning Activity Paradigm proved to be a purposeful, goal-oriented, rule-based and playful environment for learning Grade 7 curricular vocabulary. As a design oriented study involving multiple iterations, reflections, re-framings and testing, the outcomes indicated that students, when given the opportunity to deviate from “drill and practice” are capable of generating their own content as creators and co-creators, and of sharing their learning as social constructors of knowledge.

## APPENDIX A – EXISTING PRODUCT RESEARCH

### a. Educational Games – Precedence

As Arne Duncan, who is, at the time of this writing, United States Secretary of Education, suggested, “kids love games, so why not use them (games) to teach?” (Digital Nation, 2007, n. p). Research indicated that although video, digital and electronic games have been on the rise for the past 5 years, educational software targeting children has dramatically declined (Klopfer, Osterweil, and Salen, 2009). Mizuko Ito (2007), examining different factors that contributed to educational game failure, categorized educational software into three different genres of games such as Academic, Entertainment, and Construction.

The ‘learning games’ for children first originated in the late seventies and early eighties, where educators and software developers created products for children under 10 years old, embracing both educational and entertainment vernaculars (Ito, 2007). This approach provided an alternative method to the practice and curriculum-based instructional approaches (Ito, 2007). The new software products originated from video game avenues and were developed for arcades and game consoles. Games such as *Oregon Trail*, *Reader Rabbit*, and *Where in the World Is Carmen Sandiego?* became some of the first learning game software created, targeting elementary-aged children and embodying a “learning through play” philosophy (Ito, 2007).

During the eighties and nineties, products created by companies like TLC became successful. Developers eventually discarded curricular and didactic goals of the early generation of school-oriented software, and combined both visual and narrative elements from popular culture. And although *Math Blaster* appropriated a “drill-and-practice” type of instructional mechanism, a shooter game vernacular was merged with it, resulting in a more motivational, action-oriented game (Ito, 2007).

### b. Educational Games – Academic Genre

Ito (2007) described “Academic Games” as mostly “drill-and-practice” exercises affixed to the “narrow curricular goals of the traditional classroom” founded by educators who desired to merge academic content with a gaming vernacular. Around the year 1990, educational software development had deviated from an innovative research approach toward a commercial design approach, resulting in “...upgrading graphics and sound and refining established formulas rather than on developing new models for interaction or game design” (Ito, 2007, p. 93). Criticizing this ap-



proach, Ito (2007) stated that “this is one example of a hybridization of educational and entertainment genres, but done in a way that kept them as essentially separate domains of activity” (p. 94). The model described by Ito can be observed within the majority of recently developed learning games, such as *Carmen Sandiego’s ThinkQuick Challenge*, *The ClueFinders Reading Adventures*, and *Quiddler*. For the past 10 years the commercial model for educational software has remained intact.

Today’s most typical game design found in learning software is based on merging academic games with role-playing scenarios. As a player sets out to complete a mission, he or she encounters various problems and puzzles, unrelated to the role-playing fantasy narrative, yet wholly related to the academic subject matter. *Jump Start*, *Island of Dr. Brain* and *21 Academic Skill Builders: Online Educational Games* are examples of this design model. The merging of academic games with role-playing scenarios highlights the need for deep, content based, educational platforms that are adaptable for delivery formats such as the use of smart-phone applications for teaching mathematics and English. The Southwest High School in Jacksonville, North Carolina, is an example of a pilot study where existing content is repurposed for a different delivery format to teach students mathematics (Svoboda, 2009).

### **c. Educational Games –Entertainment Genre**

The second category of children’s educational software development, “Entertainment Games”, is a relatively broad genre, that has emerged from the commercial software industry (Ito, 2007). In Ito’s (2007) formulation, entertainment games are socially based and family oriented, claiming to be most appropriate for young children under 8 years of age. This genre, in marketing, usually depicts children as “ecstatic and pleasure-seeking rather than reflective and brainy, and childhood as imaginative, pure, and joyous” (Ito, 2007, p. 98). However exploratory and narrative-based these games are often lacking in academic content. Typically, these games exist in various online environments. Nintendo DS software, Frog Learning Toys products, and mobile applications are examples of learning products of the entertainment genre.

Entertainment titles can also include software such as authorware<sup>1</sup>, interactive story-books, or simulations, and often contain “click and explore” features, where clicking on certain

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<sup>1</sup> Authorware is a program that supports production of hypertext or multimedia applications. Authorware enables one to create a final application by linking together objects, such as a paragraph of text, an illustration, or audio/video files.

areas of a scene will trigger captivating animations and sounds (Ito, 2007) . Titles such as *Club Penguin*, *Dora the Explorer*, *KidPad*, and *Lego Online Games* are some examples of the entertainment genre.

#### **d. Educational Games – Construction Genre**

Software development positioned as authorware and construction for youth progressed simultaneously with that of entertainment. The constructivist method, as defined by Seymour Papert<sup>2</sup>, focuses not so much on academic or cultural content, but more on providing tools for creation (Ito, 2007) . The construction genre, which includes successful titles such as the simulation game *SimCity*, and the youth-oriented graphics program *KidPix*, has grown increasingly popular in recent years.

Authorware and construction titles aim for personal identification, customization, and authoring, rather than an affirmation of particular educational benefits (Ito, 2007). **The Construction** genre consists of technical knowledge, which provides users with the ability to employ authorware as media assets (Ito, 2007). Ito (2007) suggests that games within the construction genre do not constitute what is typically considered to be a ‘learning game’. As Papert suggested, “the educational value of these games (construction) lies less in their ability to convey academic content than in a certain stance toward technology, authoring, and creativity, a set of activities that is neither obviously ‘entertainment’ nor ‘educational’ ” (Ito, 2007 p. 104).

#### **e. Commercial Games**

In recent years the interest in commercial game applications for education has seen a steady increase. A commercial game is one that is a “purposeful, goal-oriented, rule based activity that the players perceive as fun”, which could be categorized by two main components: “an interactive virtual playing environment, and the struggle of the player against some kind of opposition” (Klopfer, et al, 2009, p. 4).

Research suggests that over 154 million Americans are actively engaged in gaming, citing that over 45 million households possess video-gaming consoles (Klopfer, et al, 2009, p. 4). Liberman (2009), studying players’ motivation while engaged with commercial game activity, argues

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2 Seymour Papert is a mathematician, computer scientist, educator and advocate for the use of computer programming as an educational tool. He is one of the pioneers of artificial intelligence, and inventor of the Logo programming language.

that “commercial games have pedagogical advantages over games created by educators”, pointing out their strong benefits for the learning process (n.p).

While not specifically designed as educational products, commercial games provide active learning environments for multiple skills development. For example, *World of Warcraft*, *Civilization* and *Samorost* are games that demonstrate educational implications by offering engrossing problem solving and strategy development (Klopfer, et al, 2009). Liberman (2009) argues that commercial games stimulate students creativity by allowing them to “modify games and to create new scenarios, quests, game mechanics, art assets, creating interactive stories” (n.p). He further postulates that complexity in these games “is a prerequisite for a game to ‘address the upper levels of Bloom’s Taxonomy’ and most complex games ‘are commercially developed software games’” (Liberman, 2009, n. p). Research also revealed that the elaborate nature of commercial games provides a more beneficial ground for education than “mini-games”, since the former “are more immersive and focus more deeply on strategy and decision-making” (Liberman, 2010, n.p).

The research into genres and commercial games illustrated how “off shelves products” are being integrated into classroom curricula more frequently than in previous generations. A variety of precedents researched for this study described the success for development in the merging of the active learning tools of gaming, with curriculum. Popular games, such as *Civilization*, are at present being employed in a variety of classrooms across North America to enhance the student’s understanding of social functioning and history. Many academics agree on the use of commercial games as a constructivist learning approach appropriate for classrooms, and suggest that those students engaged in gaming activities merged with a curriculum, display a higher level of motivation in learning in general, compared to those studying in the traditional way (Liberman, 2010).

## **f. New Approaches In Educational Games**

During my investigation I uncovered new strategies in educational games, which upon thoughtful study, proved to be capable of providing learning environments that “make academic content a necessary tool”, and where digital quests augment already established project-based curriculums (Barab, 2009 p. 77).

*Lure of the Labyrinth*, a digital game funded by the us Department of Education, which specifically aims at education, contains a puzzle adventure for pre-algebra, intermediate students

and constitutes a powerful synthesis between educational and entertainment vernaculars. Based on an appealing narrative, the game provides students with “transformational play” that involves knowledge quests and interactive tasks, that challenge the player intellectually (Barab, 2009 p. 77). As Barab suggests (2009), “merely playing a game does not ensure that a student is engaged in transformational play” (p. 77). To play transformationally, a student “must become a protagonist, who uses the knowledge, skills, and concepts embedded in curricular content to make sense of a fictional situation”. This structure not only promotes a student’s interest in a studied subject, but also creates a profound engagement with the content (Barab, 2009 p. 77).

*Quest Atlantis*, a 3D multi-user learning environment, is a project that was designed at Indiana University, and is another example of a successful amalgamation between entertainment and academic environments. *Quest Atlantis* combines strategies, commonly employed in the commercial gaming habitat, with academic content. Wikipedia states that over the last four years, more than 25,000 children participated in the project, which mainly occupies an informal environment.

## **g. Interactive Approaches In Education**

In recent years, recognizing the power of digital media, educators have turned their attention to active learning environments in classrooms. The educational system is gradually abandoning the “drill and practice” learning model in an effort to utilize gaming approaches wherein students are participants of the learning process itself, acting as content generators, co-creators, social learners and social constructors of knowledge. A variety of alternative approaches have been actualized, where the use of digital technologies, in correlation with existing academic-based curriculum, has demonstrated enhanced student learning. During the course of this study many interactive approaches to education were investigated. However, for the purpose of this thesis essay I will concentrate on three projects that are, in my view, significantly relevant to my thesis research project. These three projects are: the Fernley Elementary School experimental class, *Institute for Play – Quest to Learn* grade 6–12th program and *Equator: The Ambient Wood Project*.

Through my research it became apparent that games, not only video and/or digital, but any active explanatory games, allowed players to attain situated knowledge (that is knowledge gained from an experience), therefore empowering them to construct motivational, deep and heterogeneous cognition. As *SimCity* designer Will Wright, pointed out “all games are educational...” (Lieberman, 2009, n. p). Games allow students to exercise the five important aspects of

freedom described by Klopfer, Osterweil, and Salen (2009). These include the freedom to fail, the freedom to experiment, the freedom to fashion identities, the freedom of effort and the freedom of interpretation. These five aspects result in new knowledge production and the construction of knowledge.

While researching distinctive approaches in education involving active learning, I encountered an experimental grade 4 class at the Fernley Elementary School, in Fernley, Nevada. Fernley Elementary School has been using digital technology to exercise these five distinct aspects of freedom. The school provides not only one laptop for each child, but also creates active writing and reading activities, in which students use word processing, drawing, or music in a single document to demonstrate their own understanding of concepts.

The grade 4 class uses a Web site, which contains instructions; multiple links to learning centres; and files, which include graphic drawing applications, digital worksheets, URL's, media files (pictures, audio, or video) and corrected work. The school's officials noted that students, upon their engagement with the project, gained more control when reading the traditional book format as well as off the screen. The school's officials recognized the power of digital media not only as a tool for social networking or gaming, but also as a means to construct advanced knowledge. The 4th graders were able to obtain a better understanding of how to navigate and find information, and became more proficient at deciphering visual language.

Another important innovative approach in education is the *Institute for Play* project, founded by Katie Salen. The Institute's grade 6–12 *Quest to Learn* program promotes gaming literacy through play, content analysis, and game creation as a basis for learning within blended, formal and informal learning environments (inside and outside of the school walls). The program is not focused on the use of commercial video games as part of its academic curriculum, but is entrenched in accommodating an active learning method, which constitutes a gaming principle, to produce immersive, game-like learning experiences for students through creative explorations.

Students actively participate in the learning process by creating their own games. They explore and analyse unfamiliar environments, participate in story writing collaboratively, use strategic thinking to make choices, solve challenging quests and receive peer- to -peer feedback. Through various activities, *Quest to Learn* enables students to become protagonists of different characters “as they work through a dynamic, challenge-based curriculum with content-rich questing to learn at its core”. In the *Quest to Learn* program, youth learn by doing. They transfer that experience into cognition by developing a stimulation for knowledge creation through new quests while conducting personal connections as part of the learning process itself.

*Equator: The Ambient Wood Project* is a collaborative and exploratory experience created by an Interdisciplinary Research Collaboration at the University of Sussex, Britain. The project involved groups of four students, ages 11–12 years, from Varndean School, Brighton. In an outdoor active learning experience students worked in pairs, in two different woodland environments, with the goal of learning about the habitat. The project focused on scientific enquiry, experiments, and reflections. CALL and MALL frameworks were used to digitally augment and enhance the physical experiences of the woodland explored. The learning activity was divided into three phases which commenced in a blended learning environment.

The first phase was an active exploration of a woodland habitat in an outdoor setting (informal environment). Students were asked to investigate different habitats of plants and animals and determine the relationships between them. The second phase consisted of reflection and hypothesising about the habitat explored during phase one. Students participated in discussions, mediated by a teacher, speculating about their findings (formal environment). During the third phase, students were able to prove their hypotheses by engaging in experiments back in the woodland habitat (informal environment).

It is clear that this three-staged learning experiment reflects aspects of Bloom's taxonomy domains, formerly outlined in this paper; particularly Bloom's first domain, suggesting *recall of received knowledge*, which could be observed in phase one. His second domain, *understanding of knowledge* could be seen in phase two; and his third domain, the *application of knowledge in new situations*, which could be seen in phase three.

An analysis of *Equator: The Ambient Wood Project* suggests new ways in which MALL and CALL frameworks could be utilized in blended learning environments for content creation and social meaning making. It also illustrates the possible emergence of new forms of collaborative interaction and reflection for learning.

A study similar to *Equator: The Ambient Wood Project*, was conducted by Wong and Looi (2010). Their research into language learning, with the use of MALL and CALL frameworks, was part of a pilot study outlined in *Vocabulary Learning By Mobile-Assisted Authentic Content Creation And Social Meaning-Making: Two Case Studies* paper. In their paper, Wong and Looi (2010) argued that in recent years the use of CALL and MALL frameworks has shifted from content based delivery to a more design oriented approach, therefore shifting learning theories from behaviorist to constructivist approaches (Wong and Looi, 2010).

For this pilot study, students were supplied with cell phones after having just learned new Chinese idioms in class. In this informal environment they were asked to visually represent their

understanding of the idioms. Subsequently, in a formal environment mediated by a teacher, students engaged in critical analysis of their visual knowledge. Favouring a constructivist approach for the communicative use of technology, and stressing the use of language in simulations and text reconstruction, the pilot study was a productive experiment, leading to students' enhanced connotative understanding of complex meaning, which is often lacking in the "drill and acquisition" approach.

## APPENDIX B – CULTURAL PROBES AND PARTICIPATORY DESIGN DEFINITION OF NEEDS

### a. Description

In order to gain a better understanding of the language learning processes of the GG students, cultural probes were designed and distributed to the participants in order to solicit their language-learning related beliefs and desires, as well as to determine aesthetic preferences, cultural concerns, and design ideals. The cultural probes inquiry was done in an empathetic and engaging manner (Gaver, Dunne and Panceri, 1999). Topics centred on day to day language application and the learning experience of language (Figure Ap.B.4).

The designed cultural probes package contained 5 different activities, which were distributed to eight, grades 6 and 7 students, and collected one week later. The first activity contained a set of sixteen cards depicting different images and scenarios. Corresponding to each card set was a second set each with sad, funny and indifferent faces (Figure Ap. B.2). Students were asked to place one face on each card to denote their reflection of the depicted image or scenario related to language learning.

For activity No. 2, students were asked to place one object or image into a provided clear ball, which reflected their feelings and/or experience of each day of the school week (Figure Ap. B.2). They were also suggested to write small notes describing their relationship to the submitted



Figure Ap.B.1 Visual representations of the words *Right*, *Show*, and *Trip* taken by students for the activity No.4 of the cultural probe process. Photo by Slava Shmakin





Figure Ap.B.2 Cultural probes, activities No. 1, 2, and 3. Photo by Slava Shmakin

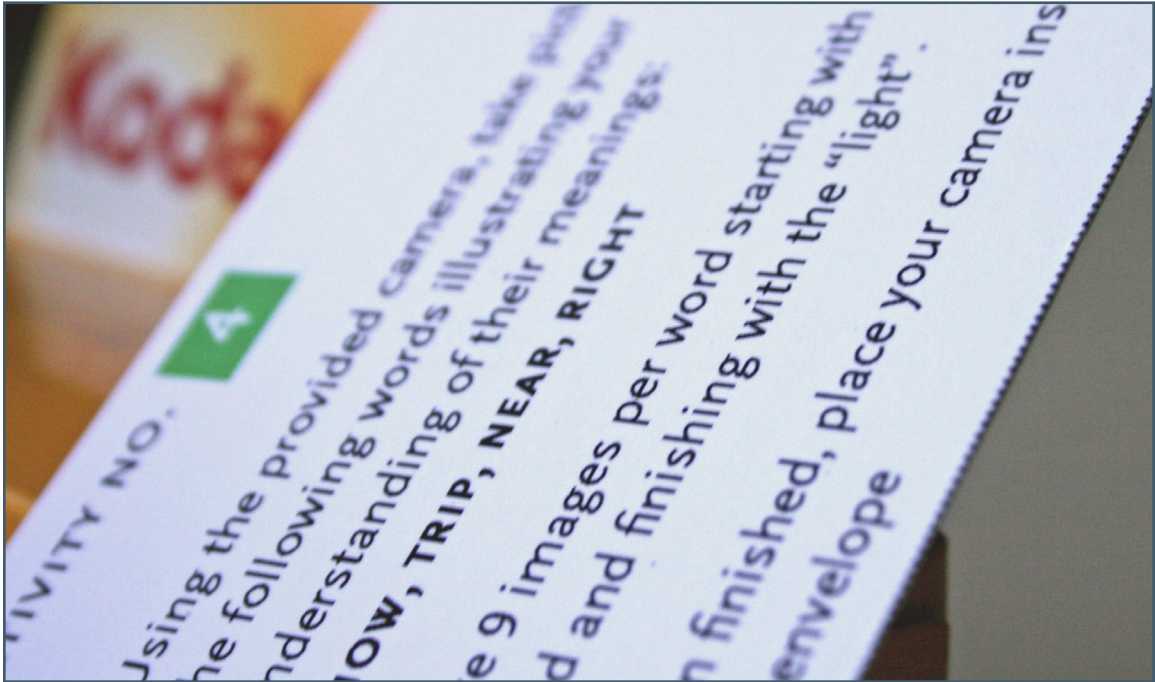


Figure Ap.B.3 Cultural probe, activity No. 4. Photo by Slava Shmakin



Figure Ap.B.4 An assemblage of the cultural probes to be distributed to grade 7 students. Photo Slava Shmakin

image or object. This process was carried out each day for five days.

Using puzzle pieces as a part of the participatory design activity No. 3, students drew a narrative of a one in-school event of considerable significance. The last activity No 4 involved the use of disposable cameras which operated as a raw canvas allowing the students to visualize their own understanding of three words in a creative and expressive manner. Students used words selected by me such as “show”, “trip” and “right” and were instructed to take three pictures for each word (Figures Ap.B.1, Ap.B.3 and Ap.B.5).



Figure Ap.B.5 An assemblage of the cultural probes to be distributed to grade 7 students. Photo by Slava Shmakin

## b. Interpretation

After students completed their cultural probe kits, the data was synthesized as comparative graphs: “Students’ Assumed Needs”, “Students’ Actual Needs” (see Table Ap.B.2), and a chart displaying informative “Responses From Cultural Probes, Activity No 1” (see Table Ap.B.1).

The “Students’ Assumed Needs” graph displayed information gathered from statistics and academic sources, while the “Students’ Actual Needs” and “Responses From Cultural Probes, Activity No. 1” illustrated the information obtained from the cultural probes and participatory designs. This approach allowed me to identify students’ needs in terms of high, medium and low priorities. It aided me in discovering the students’ tendencies in the language learning experience and provided an objective understanding of the GC’s needs, resulting in a more appropriate

design for the LLAP.

Through the cultural probe kits, the deficiency of a learning experience within an informal environment was clearly and consistently expressed by all the participating students. Students showcased a high level of interest in learning within a blended environment, and they produced, unexpectedly, creative and brilliant results during activity No. 4. Students were able to engage in learning outside of the classroom, constructing their own knowledge by observation, peer discussion, personal connections and exploration (Figures Ap.B.6 and Ap.B.7). Working on activity No. 4, students proved to be motivated and focused, providing positive feedback on the activity itself.

The students in activities No. 1, 2 and 4 expressed a strong need to explore and be more engaged outside the classroom environment. They described outdoor activities with friends as more essential than those of video gaming and/or social networking. Therefore, the notion of learning in a blended environment, so meagerly explored in the academic domain, and which was originally assumed by me as being a low priority need, emerged as one of significant importance.

Another substantial notion that students defined as a prominent issue, and which I initially ranked as a “medium–low” priority, was the need to integrate visual systems into the language learning experience. The participants engaged with activities No. 2 and 3 and by visually describing the language learning process, used their own sociocultural backgrounds and personal experiences to showcase disappointment in the traditional language -learning approach they are subjected to.

Through cultural probes and participatory designs, the students illustrated a strong inclination towards visual ambiguity. Ambiguity as resource in design suggests that “by impelling people to interpret situations for themselves, it encourages them to start grappling conceptually with systems and their contexts, and thus to establish deeper and more personal relations with the meanings offered by those systems” (Gaver, Beaver and Benford, 2003, p.233). Based on the results of these experiments, it was clear that the students had a coherent desire to be able to “interpret situations for themselves” and make personal connections to the subject matter. I placed Ambiguity, which was previously missing from my “Assumed Needs” graph section, within the “Actual Needs” section.

Concepts, such as “friendship”, “more challenges in learning” and “collaboration”, which are defined in the “Assumed Needs” graph, proved to be correct in terms of their relevance and were therefore transferred to the “Actual Needs” section. To my surprise, the “digital activities” and “use of computer” notions, both considered as high priorities in the “Assumed Needs” sec-

tion, proved to be much less important for students within the language- learning context than originally assumed.

All students did express appreciation for language learning, and the desire to read more, so I left the notion of “reading” as a medium priority in both graphs. The need for “more learning in a formal environment” and “parent participation in the learning environment”, which were originally defined as low priorities in “Assumed Needs”, were also left intact in the “Actual Needs” graph.

The cultural probes and participatory design data, which was gathered, evaluated and integrated with the focus group qualitative research results and academic sources, evolved into a preliminary Language Learning Activity Paradigm of concept proof. The concept proof was designed to determine the validity of the proposed idea and to demonstrate the most effective way to transfer traditional language learning into an active learning process.



Table Ap.B.1 Responses From Cultural Probes, Activity No. 1 graph

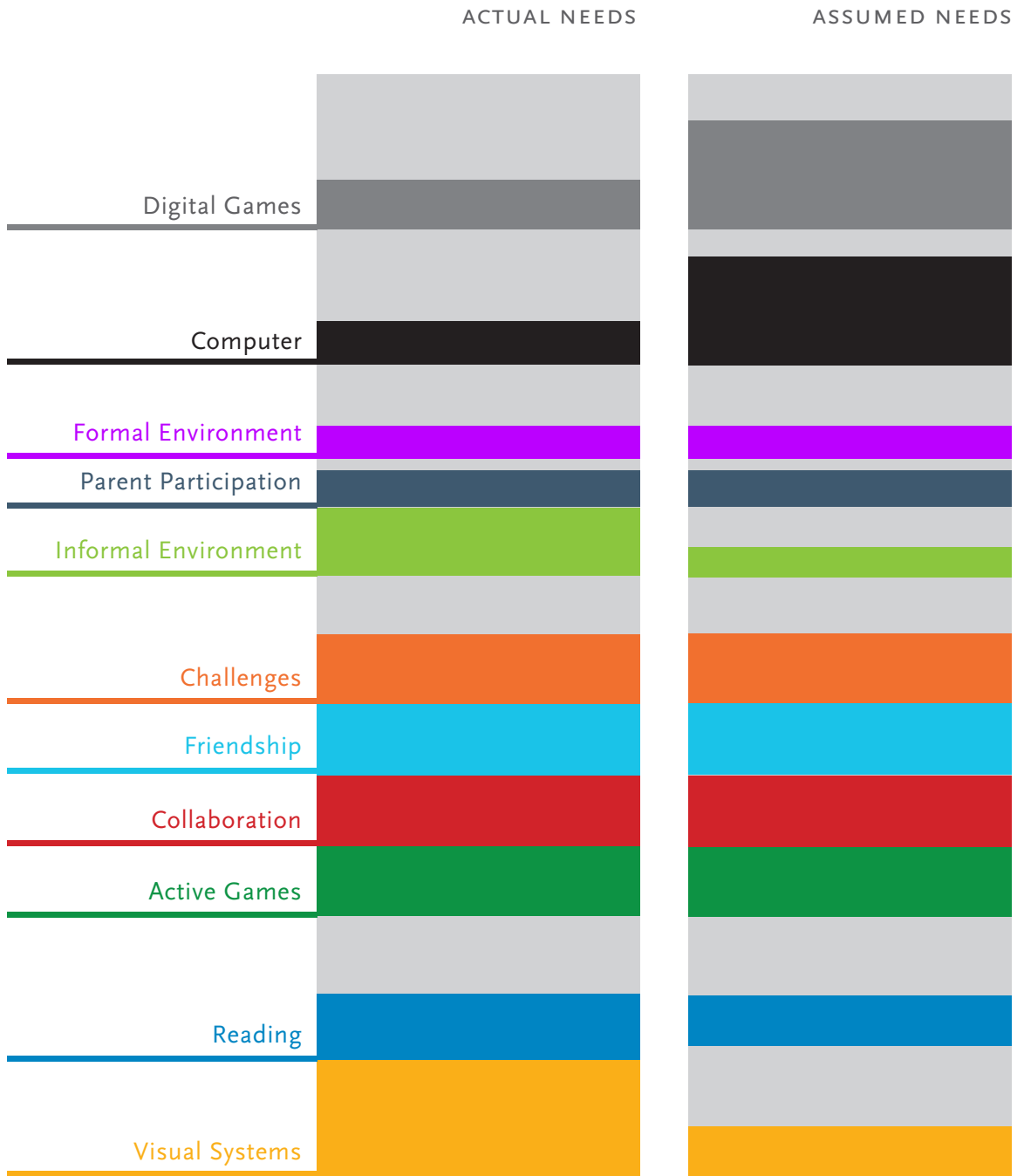


Table Ap.B.2 Assumed And Actual Needs graph



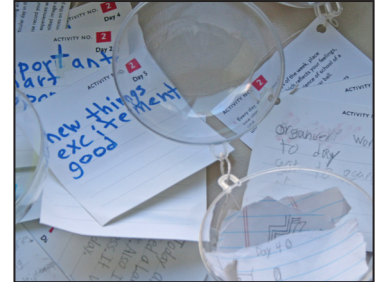
Figure Ap.B.6 Returned cultural probes. Photo by Slava Shmakin



ACTIVITY NO. **2**  
Day 2  
I put a pine cone in  
because I felt  
sharp and prickly  
and nervous about  
my first grade.



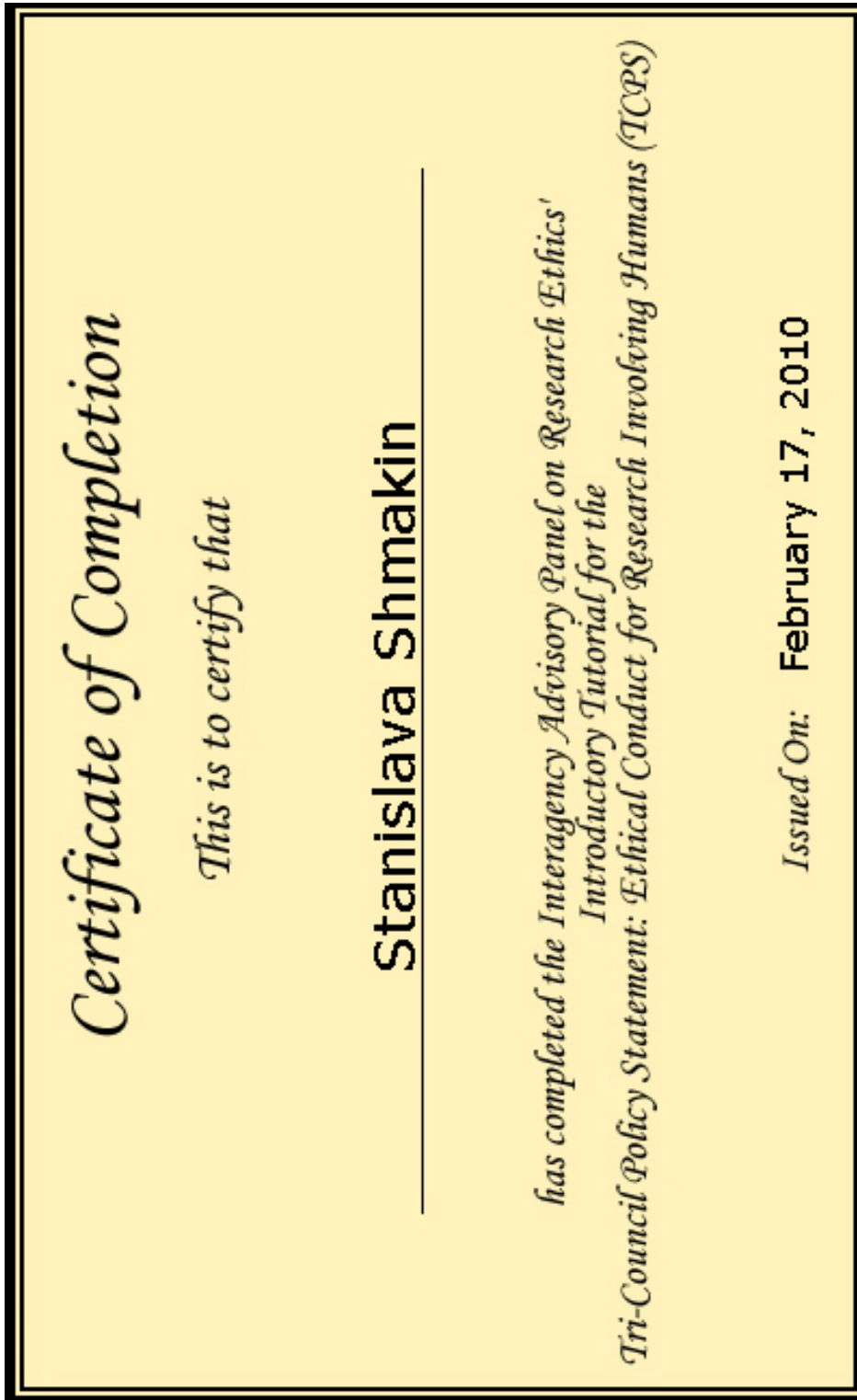
ACTIVITY NO. **2**  
Day 3  
winner  
hard  
competitive



Thursday  
we did  
art, and  
that  
made me  
happy

NO SCHOOL

Figure Ap.B.7 Returned cultural probes, activity No. 2. Photo by Slava Shmakin



Certificate of completed Research Ethics Introductory Tutorial for the Tri-Council Policy Statement

2010031002



## Vancouver Board of Education

School District No. 39

LEARNING SERVICES

1580 West Broadway

Vancouver, B.C. V6J 5K8

Telephone: 604-713-5000

Fax: 604-713-5244

June 29, 2010

Stanislava Shmakin  
c/o Deborah Shackleton, Associate Professor  
Emily Carr University of Art and Design  
1399 Johnson Street  
Vancouver, BC  
V6H 3R9

Dear Stanislava,

Thank you for your research proposal "Semiotic Paradigm - Language Learning System." On behalf of the VSB Research Committee please accept this letter as approval for you to complete your research in Vancouver schools. You have permission to contact teachers, parents, and students in Vancouver schools. We request that you make your initial contact with the principal of the school to inform him or her of your study and provide him or her with a copy of this letter. Please note that teachers and administrators are very busy with many obligations and that schools have the right of refusal to participate in any research studies. Also, the Vancouver School District does not find subjects for researchers.

The VSB Research Committee would be very interested in learning of your results and its implications for students. When your research is completed, please send us an abstract of the results.

Thank you for focusing your work within the Vancouver School District. I wish you the best of luck as you proceed with your inquiry.

Sincerely,

A handwritten signature in black ink that reads "Valerie Overgaard".

Dr. Valerie Overgaard, Associate Superintendent  
Learning Services

Office of the Director of Industry Research

**Emily Carr University of Art and Design  
Research Ethics Board**

June 3, 2010

**MEMORANDUM TO:** Slava Shmakin, MAA, Design Stream, Year Two

**Re: Application for Ethics Approval (Our Ref. 2010031002)**

The Committee met on March 10, 2010 and considered the application for ethics approval for your project titled "Semantic Paradigm – Language Learning System". Following a general discussion the application was circulated for Board input and a vetting by the Director of Industry Research.

Ethics approval was given for a period of a year. The expiry date for this approval is June 3, 2011.

If the project changes significantly you are required to resubmit a new application to the Board for further consideration.

In order that an up-to-date record can be maintained, we expect you to provide the Board with a very brief project update in December followed by a short summary once your project is completed.

Please contact the REB Chair, Deborah Shackleton if you have any specific queries relating to your application. This Chair and the members of the Board would be most happy to discuss general matters relating to ethics provisions if you wish to do so.

All Communications with the ECUREB regarding this application should indicate our reference number.

Sincerely,



Dr. Robert Inkster  
Director, Office of Industry Research

1. Should you need to make any changes to the project write to the Board giving full details including revised documentation.
2. The approval is for one year Should you require an extension write to the REB before the expiry date giving full details along with revised documentation. Extension can be granted in extenuating circumstances.
3. It is your responsibility to keep open communications with the Office of Industry Research as to project status and completion.
4. Do not forget to fill in the dates of this approval and the reference number on your Participant Information Sheets, Letters of Invitation, Consent, Assent Forms, and Release Forms

### **Informed Consent By Participants In a Research Study**

The University and those conducting this research study subscribe to the ethical conduct of research and to the protection at all times of the interests, welfare, autonomy, safety, and equal moral status of participants. This research is being conducted under permission of the Emily Carr University Research Ethics Board. The chief concern of the Board is for the health, safety and psychological well-being of research participants.

Should you wish to obtain information about your rights as a participant in research, or about the responsibilities of researchers, or if you have any questions, concerns or complaints about the manner in which you were treated in this study, please contact Dr. Robert Inkster, the Director, Office of Industry Research by email at [rinkster@ecuad.ca](mailto:rinkster@ecuad.ca) or phone at 604-844-3800.

Your signature on this form will signify that you have received a copy of this document which describes the procedures, possible risks, and benefits of this research study, that you have received an adequate opportunity to consider the information in the documents describing the study, and that you and your child voluntarily agree to participate in the study.

Any information that is obtained during this study will be kept confidential to the full extent permitted by the law. Knowledge of your identity is not required. You will not be required to write your name or any other identifying information on research materials. The signed release forms will be maintained in a secure location.

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<b>Project Title:</b>	<b>Semantic Paradigm – Language Learning System</b>
<b>Principal Investigator:</b>	Stanislava Shmakin, MAA, Design Stream, Year Two
<b>Co - Investigator:</b>	Deborah Shakleton, Associate Professor
<b>Investigator Curriculum Area:</b>	MAA Program, Design Stream

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### **Project Overview**

**Risks to the participant, third parties or society:**

No known risks.

**Purpose:**

The research study, Semiotic Paradigm – Language Learning System, aims to explore the possibility of the implementation of a visual and interactive, language learning system, with the goal of improving the cognitive development of Middle School students, specifically for the study of

# emily carr

university of art + design

Language Arts. I intend to develop an alternative learning environment, which would be more suitable for the generation growing up with all the current technology that is available to them, and who have in turn developed different thinking patterns from those of the previous generations.

The proposed language learning software would serve as an educational tool for the study of Language Arts. It would be an independent semantic exploration within the language itself, which, through visual study, would allow students to engage their intuition, empathy, logic and curiosity in order to improve their information comprehension and assessment, concentration and attention skills.

This study is intended to benefit the language learning process of Middle School students, by making it possible for them to navigate inside of an interactive software and to explore the fundamentals of the written form of language, such as sentence structure, in a game-like creative manner.

## **Scope**

I plan to concentrate on one of the following learning activities for the Language Arts class observation:

### Exploring Language With A Narrative

This activity will consist of interactive and collaborative poetry writing. It will employ new vocabulary, while introducing a range of cultures. The activity would focus on making personal connections to text, comparing ideas and information, syntax, as well as accessing and using multiple sources of information conjointly.

### Exploring Language by Learning New Words

This interactive learning activity intends to analyze the conventions of the root parts of a word (suffixes, prefixes) and their cultural connotations, in order to help students learn, spell and understand new multi-syllable and unfamiliar words. To do so, students would apply visual memory and various other strategies (e.g., phonic knowledge, use of common spelling patterns, dictionaries, word walls, thesaurus). They would share their ideas and communicate discovered information amongst themselves.

### Exploring Language with Grammar

This creative typographical play would explore grammar principles, like capitalization to designate organizations, inserting commas after introductory words in sentences and when citing addresses; and quotation marks and uses of apostrophes. Past, present, and future tenses would also be explored in this activity.

page no. 2/5

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## **Procedures (Please Refer To Appendix “A” For Full Description):**

If you agree to participate in this study, I will contact your child to implement the Semiotic Paradigm – Language Learning System research study during your child’s Language Arts classes. This study will include observational notes and images using a digital camera or video camera, questionnaires, and a software prototype testing session. Your child will participate in a group interview session and an art activity (Participatory Design) with me. This interview and art activity will include other students and teachers who will have given mutual consent to this process. This study is foreseen to last 5 months, though your participation and that of your child will be less than three hours in total.

## **Confidentiality**

If you agree to participate in this study your child identity will remain anonymous. You will be able to review transcripts, images and other material before use in publication.

## **Remuneration/Compensation**

There is no remuneration available for your participation. Participation may be beneficial to your child as an opportunity to be involved in an innovative learning process.

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## **Informed Consent/Assent Form**

I understand that I may withdraw my participation at any time. I also understand that I may register any complaint with the Director of the Office of Industry Research or the researcher named above or with the Assistant Dean or Dean of the Faculty as shown below.

Having been asked to participate in the research study identified above, I certify that I have read the procedures specified in the Study Documentation described below. I understand the procedures to be used in this study and the personal risks to me and to my child in taking part in the study as described below.

Dean: Renee Van Halm

Low Residency MAA Coordinator: Dr. Christopher Jones

Emily Carr University of Art & Design, 1399 Johnston St., Vancouver, BC V6H 3R9

Ph: 604.844.3800, Fax: 604.844.3801

I may obtain copies of the results of this study, upon its completion by contacting:

Name: \_\_\_\_\_

Email: \_\_\_\_\_

I have been informed that the research will be confidential.

I have been informed that if visual and audio material to be become public, then a separate release agreement will be required.

I understand that my supervisor or employer may require me to obtain his or her permission prior to my participation in a study of this kind.

I understand the risks and contributions of my participation in this study and agree to participate.

Your signature indicates that you consent to participate in this research project, which includes Semantic Paradigm – Language Learning System study and interview sessions, including digital/video camera photo documentation to be used for research publication purposes.



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Participant Last Name: (please print) \_\_\_\_\_

Participant First Name: (please print) \_\_\_\_\_

Parent or Legal Guardian: (please print) \_\_\_\_\_

Participant Contact Information: \_\_\_\_\_

Participant Signature: \_\_\_\_\_

Witness Name: (please print) \_\_\_\_\_

Witness Signature: \_\_\_\_\_

Date: (mm/dd/yyyy) \_\_\_\_\_

**Re - photo documentation for publication purposes:**

**I consent to the photo documentation of the research project to be used for research and publication purposes**

**I consent to the audio/digital voice recording of the research project to be used for research and publication purposes**

**I do not consent**

**RE: Digital Videography**

**RE: Audio/Digital Voice Recording**

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## WORKS CITED

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