LONG-TERM EFFICACY OF L1 TRANSLATION FOR ACQUISITION OF L2 VOCABULARY IN MIDDLE SCHOOL EAL STUDENTS

by

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Abstract

The perspective of whether L1 to L2 translation is effective for increasing vocabulary and comprehension of ELL students is controversial. Some experts have advocated for a strict immersion-only approach, disallowing the use of the native tongue, while others have argued that such restrictions increase stress and ignore the benefits of building lexical bridges organically. There is seldom an opportunity to critically research this issue in a manner that will generate reliable quantitative data, and this is a critical issue with globalization and migration in the 21st century. The opening of a new school in Vietnam with an overabundance of students with low English ability provided numbers sufficient for experimental and control groups, and an opportunity to pursue an answer to the question of whether intervention driven by L1 translation is more effective than peer scaffolding and differentiated instruction. The study examined this and related questions through the implementation of these methods in groups that featured near-identical subjects both demographically, and socio-economically. Students received identical Lexile assessments over the period of the study, and core subject teachers and teaching assistants provided qualitative feedback relevant to tangential factors such as language driven behavior, motivation, and social integration. While Covid-19 related restrictions in Vietnam threatened to untrack the study, findings reveal that L1 interpretive translation is more effective than peer scaffolds and differentiated curriculum, however, the former can be enhanced by the latter.

Keywords: Lexile, lexical network, paradigmatic L2 lexical growth, Communicative Language Teaching, interpretive translation, Systematic integration, stress, semantization

INTRODUCTION

Purpose of the Study

The purpose of this study was to evaluate the efficacy of improving vocabulary acquisition by providing systematic L1 language translation to emerging speakers of English in a dedicated English language online classroom context while weighing its impact on the understanding and implementation of English grammar conventions against immersion-only pedagogy. Many "International" schools in Asia promote a complete immersion environment, with many practicing school-wide prohibition on using the native tongue, as some educators and administrators believe that continued use of L1 slows adoption of L2 (Spahiu, 2013); the Communicative Language Teaching pedagogy promoted this philosophy. Brown, as cited in Zulfikar (2019) promotes the process by which "the target language system is learned through the process of struggling to communicate" (p. 43). Many students in Vietnam have only recently gained access to Western Primary and Secondary Education. As a result, students are being enrolled in college preparatory programs without having a functional level of English proficiency. The situation necessitates finding the most effective methods of language acquisition to facilitate rapid language progression sufficient to enable academic growth across academic disciplines.

Contrary to CLT pedagogy, Liu (2008) notes that second language learners:

> face the problem of establishing the range of reference of new words and expressions that they meet, and a good deal of exposure may be needed before they have enough experience of the way words are used to be able to do this accurately. (p. 67)

Prior studies have been conducted with results to support both philosophies; however, the question of context may be key.

Context

The study was conducted in the middle school section of a newly opened private "American" school in Bien Hoa, Vietnam. This middle school is comprised of students in grades six through eight, with study participants being limited to grades six and seven. Bien Hoa is a moderate-sized city of approximately 1.5 million people located in the Ho Chi Minh (Saigon) metro area. This school is positioned as an "American University Preparatory School" and a partnership between a Vietnamese private educational group and an elite American preparatory school from New England. The school campus was built from the ground up to provide educational services to over 2,000 students, including a large boarding division. The majority of enrollees are the children of parents who have benefitted from the emerging economy, and their families are Vietnamese monolingual. Unfortunately, due to the Covid-19 outbreak in May of 2021, the school could not open in August as originally planned. All classes are currently taught online, with the possibility of a transition to classroom learning in January 2022.

Statement of the Problem

In the developing country of Vietnam, English has not gained a widespread foothold in the educational system. While English is commonly taught at public schools in Taiwan, South Korea, and other developed countries in Asia, public schools rarely offer English as a second language in Vietnam. With rapid economic growth occurring in Vietnam, the country is now seen as a viable market for *for-profit* educational institutions specializing in preparing students for international post-secondary education. Unfortunately, the lack of English-Functional students as a customer base means that admissions standards set by the American Educational Administration are not adhered to by the Vietnamese organizational side. This has resulted in a massive influx of students who are significantly below expected levels. While some of the

students previously studied in a *bilingual* private school, the majority had little more than a few terms at an English cram-school. Parental concerns regarding *screen time* have resulted in a shortening of class periods during Covid-19 lockdown. With classroom instruction limited to 45 minutes per block, social constructivist practices like scaffolded breakout groups are almost impossible, and even basic differentiated instruction is difficult.

Rationale

Of the 70 students in grades six and seven, approximately 75% scored at or below 350 Lexile as measured by the *Scholastic Reading Inventory Test* administered by the English teacher on September 20, 2021, and 15% scored below measurable levels. Only two scored above 800, with one student in grade six and one in grade seven scoring at a basic (below grade) level for grade six. With student reading proficiency this far below level, grade level materials and textbooks are wholly inaccessible. The situation has been worsened by online learning and related time restrictions limiting peer modeling and scaffolding opportunities. Without adequate language ability, comprehension is inadequate across all academic subjects. In describing school as primarily a social institution, John Dewey (1938) postulated that "the school must represent present life – life as real and vital to the child as that which he carries on in the home, in the neighborhood, or on the play-ground" (p. 3). Devoid of functional English ability, students at the school are as far from that ideal as the east is from the west. Teachers are frustrated with assessment results, and students are at-risk of what would clearly be *miseducative* experiences.

Prior Interventions

Some use of L1 translation has been provided, along with on-screen translation of some key words and phrases, but nothing systematized has been implemented. Prior studies by others

have shown that using L1 as an intervention tool may also increase student interest and improve their ability to manage their time and tasks (Storch & Wigglesworth, 2003).

Research Questions

1. What impact does L1 translation have on Lexile level in middle school EAL[1] students in a linguistically homogeneous L2 classroom.
2. What impact does L1 translation have on acquiring and applying L2 grammar conventions in the same population?
3. What impact (if any) does L1 translation in ELA[2] have on student behavior and performance in other core courses?

Significance of the Study

As it currently stands, the situation at the school in Bien Hoa, Vietnam, is untenable and unsustainable. Grade six and grade seven students will directly benefit from the outcome as it provides a direction for future intervention methods and a platform to either defend or support positions for or against the implementation of L1 language and related pushback from stakeholders (parents and administration). Over the long term, the validation of L1 and specifically Vietnamese as an L2 English acquisition tool will strengthen the ability of the school to accomplish its mission and implement a more effective teaching and learning program. On an even larger scale, the continued growth of Vietnam will doubtlessly give rise to more international schools facing this same dilemma.

Literature Review

Introduction

[1] EAL: English as an Additional Language
[2] ELA: English Language Arts

Acquisition of English proficiency is the Asian gold rush of the 21st Century. With economic growth and new market economies stepping onto the global stage, the perceived value of English as necessary to gain a competitive edge in the new marketplace is unquestioned. Singapore already recognizes English as its second native language, and Taiwan passed legislation in 2018 targeting 2030 as the year they will be bilingual with English as a native language (Financial Supervisory Commission, R.O.C., 2019). The number of English cram schools in Taiwan has increased from 372 in 1990 to more than 17,000 as of 2018 (Tsai, 2020). Numerous countries in Asia are rushing to catch up as their economies experience rapid growth. This study is going to examine the efficacy of accelerating vocabulary acquisition using L2 translation. In addition, it will examine the rate of improvement of student performance and student behavioral outcomes when translation is provided. Finally, it seeks to provide substantiative documentation reinforcing the use of L1 as a regular classroom practice when stakeholder objections arise, by arguing that building Lexical understandings by introducing L2 words requiring mass syntagmatic insertion is considerably more difficult and less effective than inserting L2 into existing constructs (Wolter, 2006).

Literature Review

All the literature reviewed is directly related to the issue of utilizing L1 in teaching English to L2 learners. While some of the sources utilize quantifiable data to some extent, most of the information presented is qualitative. The categorization is by examination of the need for a systematized L2 intervention, frequency of intervention, and objectives and outcomes. All research examined effectively approaches L1 intervention in a causal manner, so the review is structured to reflect that. Contemporary research often appears to approach the subject of L1 use in teaching L2 prejudicially and largely presents CLT and Audiolingual methodologies in a

negative light. Brown (2000), which presents numerous pedagogical approaches including CLT and Audiolingual in a neutral, documentarian manner with accompanying vignettes, has also been included.

The Need for L1

Globalization has brought people together in ways that were not imagined even 40 years ago. The proliferation of the Internet and electronic communications has broken down walls and many variables have created human migration to a level that was never considered. Much of what has become pedagogical tradition was founded on ideas that didn't consider the 21st century classrooms in a world seeking to facilitate communication. Restricting L1 for EAL students to create a truly immersive environment, while perhaps stress-inducing, made some degree of sense in a class where differentiation was a viable option and overuse of L1 would remove opportunity for inquiry and learning (Spahiu, 2013). In a classroom filled with EAL students still presenting curriculum based on Western Standards without L1 intervention is unrealistic. Because of this new reality where international classrooms are linguistically upside down, a structured means of delivering content uniformly while promoting student interaction and maintaining discipline is necessary, and the use of L1 provides such an approach. Brown (2000) identifies the shift in classroom demographics that occurred during the latter part of the twentieth century and compiled the book to provide "a principled approach to interactive language pedagogy" (p. xii). In a predominantly EAL classroom, use of L1 has many potential benefits. Using L1 helps students stay on task and makes completing work easier as students can better grasp instructions provided (Storch & Wigglesworth, 2003)

The drive for linguistic diversification has led to an influx of below-level English students into International School programs in countries like Vietnam and Indonesia, creating a

challenging situation for teachers charged with providing Western Standards-based education to students who are not classroom ready. Many educators and administrators in Asia adhere to the Principles of Communicative Language Teaching (CLT) or Communicative Language Approach, believing that "The target linguistic system is learned through the process of struggling to communicate" (Brown, 2000, p.45). Others cling to the Audiolingual Method, where "the use of the student's native language is forbidden" (p. 45). Even in Japan, the Ministry of Education, Culture, Sports, Science, and Technology, have issued plans and activities that restrict or discourage L1 use (Ochi, 2009). Contemporary research shows that such methods may have results that are contraindicative to these approaches. Stress from the inability to communicate ideas and understand classroom communication can result in a decreased efficacy of language acquisition and a loss of feelings of security (Zulfikar, 2019).

Frequency of L1 Intervention

As far back as the 1970's the CLT approach realized that there will be occasions where utilizing L1 in an L2 classroom is necessary (Brown, 2000). The real argument in contemporary scholarship is *how much is too much*? Wolter (2006) suggests that rather than acting as a crutch in the manner described by opponents of L1 use, consistent use of L1 in an L2 classroom will help students form Lexical structure. Experientially, a second language is more like adding additional words to a learner's vocabulary than creating a separate word bank. The human mind isn't compartmentalized so neatly. It is not unlike the Lexical range seen in English, where "trunk" may have five different meanings depending on context. Within the English classroom, Ochi (2009) implemented an intentional system of interpreted training that mimics methods used by professional interpreters when they need to acquire new vocabulary rapidly. Outside of strictly the English classroom, L1 intervention should occur at all points where instructions are

presented and when students are working in a group context. As Zulfikar (2019) observes, restricting the use of L1 lowers the effectiveness of collaboration, and the Vygotskian position that language facilitates communication and encourages cognitive growth. Much of the research indicates the needs for both a systematic integration of L1 into L2 classrooms and organic implementation in group and socially driven contexts; however, little research has been presented (qualitative or quantitative) to indicate whether L1 for vocabulary acquisition inhibits or degrades the adoption of grammatical conventions.

Objectives and Outcomes

Many of the desired objectives and outcomes from L1 implementation are difficult, if not impossible, to quantify. Reduction in stress, improvement in behavioral outcomes, teamwork, improving the sense of security or confidence (Spahiu, 2013) are goals with visible outcomes, and may be investigated through survey results and interviews. It does not produce statistical data barring significant sample sizes and repeated inquiry. Even then, answering the question of *how effectively* may not be possible. That said, qualitative responses have shown highly favorable feedback regarding these areas. That said, Wolter (2006) has cited research that indicates paradigmatic L2 Lexical network growth through existing L1 networks is possible. Liu (2008) also noted that utilizing an existing memory structure such as an L1 work provides an anchor point for acquiring new vocabulary. This is measurable with use of a control group. Psycholinguistics and Cognitive Psychology lists five basic memory stages: “acquisition, registration, storage, access, and transfer” (Ochi, 2009, p. 126), and it would stand to reason that efficacy may be measured within these parameters through basic assessments. Liu (2008) provided quantitative results comparing a control group with an experimental (L1 applied) group, and the experimental group scored marginally higher, leading the research to conclude

that with all variables considered, a bilingual method is preferable due to its secondary benefits and potential for semantization over the long-term.

Topic Review

This is effectively covered in the introduction but included here. To restate it in brief, globalization has created classrooms beyond the reach of differentiation. In some instances, the majority of students in a classroom are EAL. Additionally, stimulating paradigmatic L2 Lexical network growth through existing L1 networks carries implications for second language studies in normative learning environments.

Summary

Much research has been done concerning L1 in an L2 classroom, but these changing times have rendered earlier thoughts invalid. Nevertheless, some of the concerns regarding the use of L1 in an L2 learning environment (Brown, 2000) are justified.

There is the potential for L1 to be a crutch and have the secondary effect of reducing student effort. On the other hand, as Ochi (2009) noted, repetition and systemization will bridge understanding and promote acquisition. A real-world example of what the research shows can be seen among foreign staff and students at international schools. Schools in Asia often have “flag ceremonies” where the school gathers monthly (or weekly) to sing the national anthem. Through this repetition, foreign teachers and native English speakers who do not speak the local language often learn the national anthem. When done intentionally in the classroom, L1 can serve to enhance student experience by lowering stress and improving comfort levels while improving learner outcomes through “the stimulation of schemata” (Zulfikar, 2018, p. 49). Modern research, particularly those with substantial experiential feedback from students and teachers, is very valuable for developing pedagogical processes. Approaches by each author are notably

different. Wolter (2006) and Storch & Wigglesworth (2003) appear to be coming from a native English, pragmatic view, focused on helping to bridge understanding, while Liu (2008) and Ochi (2009) appear more oriented toward accuracy and vocabulary acquisition. Zulfikar (2019) and Spahiu (2013) express high levels of concern regarding emotional and social development. Finally, Brown (2000) is a clinical presentation of past and current pedagogies, and as stated was included strictly for its clinical value. Collectively, this research shows a pattern but gaps within the pattern that may prove even more useful for future studies.

METHODOLOGY

Purpose of the Study

The purpose of this study was to evaluate the efficacy of improving vocabulary acquisition by providing L1 language translation to emerging speakers of English in a dedicated English language online classroom context while weighing its impact on the understanding and implementation of English grammar conventions against immersion-only pedagogy.

Research Questions

1. What impact does L1 translation have on Lexile level in middle school EAL students in a linguistically homogeneous L2 classroom.
2. What impact does L1 translation have on acquiring and applying L2 grammar conventions in the same population?
3. What impact (if any) does L1 translation in ELA have on student behavior and performance in other core courses?

Study Population

Two groups comprised the population. Both groups are racially and ethnically homogenous native Vietnamese grade six (G6) and grade seven (G7) EAL students between

eleven and thirteen years old. The sixth-grade group consisted of 39 students, while the seventh-grade group consisted of 25, with one having been excluded from the results due to a suspected cognitive disability**.** All students are from approximately the same upper-level socioeconomic strata. All participants studied in bilingual schools or received supplementary English instruction prior to September 2021. All students are currently enrolled in an American School in Vietnam using UBD (Understanding by Design) framework for curriculum. Other than the excluded student in the control group, there are no known or reported cognitive disabilities within the population.

Population Justification

Both groups are equal in socioeconomic and ethnic backgrounds, so any deviation should not be significant enough to affect the outcomes. The experimental group was selected organically, as the G6 class lacked a sufficient population of on or near-level students to facilitate implementation of normative differentiation and scaffolding methods. 29 of the 39 participants in the G6 group were below 380 Lexile (with many below measurable threshold) prior to intervention, meaning that their reading comprehension measures in the expected range for the lower-level readers in grade 1. No students in the group measured on-level, with only two students approaching on-level. The G7 group was selected to provide the control as there were 13 students below 380 Lexile. However, there were also 14 students above 700, with several approaching on-level. It was decided that since the G7 group had enough on-level students to utilize traditional instructional pedagogy and peer scaffolding, the G7 population that is significantly below level will serve well as a control group with traditional differentiation and scaffolding and little to no instructional use of L1 during class. Low-level students in both groups are receiving ESL instruction during pull-outs, and L1 use is allowed during group or

breakout work. Translation is not being withheld when requested by students in the control group; however, it is not being systematically utilized. The ten specific students selected as control had Lexile scores placing them in grade three or below; however, data was collected on all students in both grades and is included in the appendices of this report.

Intervention

The research was conducted over five months, spanning from September 20, 2021, when the baseline Lexile exams were given, until March 9, 2022. L1 use was systematically employed with the G6 population during instructional time, while peer scaffolding and L2 immersion was employed with the G7 population. All intervention, observation, and assessments were made in and during the normal school setting and using standard and accepted educational practices. From the perspective of the students, the research is effectively invisible.

Intervention Plan

The intervention was conducted from September 20, 2021 until February 25, 2022. During instructional time with the G6 population, the Vietnamese co-teacher translated words and phrases during whole class and group instruction. She was free to interact with students and use L1 at any time. During the 3rd term of the intervention, a systematic implementation of L1 for L2 instructional time similar to the *Japanese Interpreting Training Method* (ITM) (Ochi, 2009) was intended to be implemented. Due to the continued Covid-19 protocols in place in Vietnam, this proved impossible until the final week of the study. The students were divided into leveled groups, with direct sentence and vocabulary translation delivered in a dialogical (responsive) manner, in an effort to stimulate rapid paradigmatic L2 lexical growth. During the same time period, the G7 group will receive peer scaffolding and primarily L2 immersion (with

both groups receiving additional ESL instruction outside of class). Both groups received their final Lexile assessment for the purposes of the research on March 7th and 8th, 2022.

Sources of Data

Data was collected using both student scores on electronically delivered standardized assessments and through interviews and surveys completed by faculty members. The electronically delivered data will provide quantitative feedback as to the effectiveness of the intervention methods when weighed against the control group. Quantitative data will allow for a scientific and replicable measurement of student abilities when provided with two different pedagogical approaches (Daniel, 2016).

Instrumentation

For the quantitative data collection, the Scholastic Reading Inventory test was given at four-to-six-week intervals (dependent upon holidays and school calendar). The Scholastic Reading Inventory is an accepted measurement of Lexile level that is distributable through the Blackbaud online learning platform being used for content delivery by my school during Covid-19 isolation. It contains 45 comprehension-based questions and the number of correct responses correlates to a Lexile score. This test was chosen for its accuracy, its ability to be digitally delivered, and its recognized merit among the education community (Mathewson, 1988).

A mixture of quantitative and qualitative data was compiled using longitudinal surveys given to both foreign and local teaching faculty of all subjects for both the G6 and G7 groups. The surveys contained a mixture of open-ended discussion questions, as well as questions requiring a numeric response on a linear scale.

Research Procedure

The researcher contacted the Associate Heads of School over Administration and Academics, as well as the head of the school and presented them with the baseline data from the initial administration of the Scholastic Reading Inventory Test given on September 20, 2021. The scores clearly indicated severe English language deficiencies in the majority of the G6 student population, and many in the G7 population. The researcher suggested to administration that since there was insufficient language-proficient students in G6 to facilitate scaffolding and support differentiation, a systematic L1 translation method should be employed to help build L2 lexical understanding using existing L1 schema. G6 was designated the experimental group (EG) in the research study. Baseline test results for EG as presented to the administration are below. Population size represents the number of students whose scores fell within the range, raw score indicates the number of correct responses on the Scholastic Reading Inventory Test, Lexile Level represents the translated score, and grade level represents the expected grade for the Lexile score. Students' scores are group in expected ranges for grade level from entering basic to entering proficient, i.e., proficient comprehension at grade 2 correlates to a 420 to 650 Lexile score, while proficient for G3 is 520 to 820; therefore students within that score range are identified as grade level 2 - 3.

Table 1

Experimental Baseline Scores

Population Size	Raw Score Ranges	Lexile Level	Grade Level for Proficient	Notes
7	n/a	n/a	n/a	*Unable to complete test due to technical difficulties
6	< 13	not measurable	beginning reader	Score below test limit for conversion
13	13 – 21	240 – 400	1	
11	22 – 34	410 – 650	2 – 3	
2	35 – 38	675 – 760	3 – 4	
Total Population	Average Score	Average Lexile	Median Lexile	
39*	21.5	400	347.5 (Grade 1)	*Two additional Students have joined the class but are excluded from the research data.

Note: This table shows baseline test scores, Lexile equivalent, and corresponding reading level for the experimental group.

Unlike G6, G7 had a large enough language proficient population to support differentiation and was able serve as a control group (CG) with the ten weakest students serving in that capacity for Lexile metrics, and the entire population serving as a control for behavioral metrics and qualitative feedback.

Table 2

Control Group Baseline Scores

Table 2 - Baseline Evaluations for G7 Control Group				
Population Size	Raw Score Ranges	Lexile Level	Grade Level for Proficient	Notes
8 0 2 9 8 1	n/a < 13 13-21 21 – 34 35 – 38 41	n/a 375 410 – 650 675 – 760 880	n/a 1 2 - 3 3 - 4 5	*Unable to complete test due to technical difficulties
Total Population (current)	Average Score	Average Lexile	Median Lexile	
31*	31.4	605	650 (Grade 3)	*Three additional students have joined the class but have been excluded from the control group.

Note: This table shows test scores and corresponding Lexile and reading level for the control group.

G7 students scoring below the median grade level were selected as members of the CG. This included four who were unable to complete the baseline evaluation as their initial score was below the predetermined threshold.

Soliciting Participants

Acquisition of participants for the study was an example of an intersection of preparation and opportunity. As previously noted, the new school admissions team ignored the language proficiency entrance requirement, which resulted in an influx of students below level. Grade 7 and grade six students are culturally, linguistically, and racially homogeneous, and the same

teachers across both grades teach core subjects. For evaluative purposes, coworkers including local and foreign teachers were asked to fill out student performance and behavior surveys. The characteristics of the two grades provided a good, if not ideal, situation for existing classrooms to be treated as laboratories without disturbing the educational process.

Informed Consent

School administration felt that the modification of curriculum and pedagogy fell within the normal scope of operations. As no activity or evaluation that falls outside of standard assessment procedures, the administration deemed it unnecessary to seek permission or notify students or parents concerning the study. The administration is supportive of the study as the methodology could be modeled in the future if data shows evidence of meaningful improvement. Additionally, 45 CFR 46 §46.104 items (d)(1) exempts research that is conducted in a commonly accepted educational setting and involves normal educational practices from requiring informed consent (Office for Human Research Protections [OHRP], 2021).

Data Collection Procedures

The study was in the experimental phase over five months. The first step of the data collection process was to obtain a baseline score for each student by administering the Scholastic Reading Inventory before initiating the intervention. Each student participating in the study took the test electronically. Those who didn't participate in the initial test due to either experiencing technical difficulties related to Internet access or lack of understanding the procedure took the test at the next available opportunity.

Additional tests were administered monthly (between four and six weeks dependent upon the school calendar) for both the EG and CG during the five months of observation. Test scores

were compared against previous scores and between groups to provide quantitative data for direct, chartable comparison.

Core subject teachers for grades 6 and 7 completed a survey covering the evaluation periods, providing both quantitative data through scoring and qualitative data through feedback and interviews. Students will be evaluated by the rubric shown in Appendix A.
Subject teachers and Vietnamese instructional assistants will each complete the survey for each month of the study. This data will then be compiled for each student in both the EG and CG, with the results being charted to show both the amount and rate of improvement during the evaluation period.

Swain (1985) as cited in OCHI (2009) notes, “students need is not only comprehensible input but also comprehensible output in L2 if they are to be both fluent and accurate in the target language” (section 2.5). By evaluating data on a month-to-month basis over a five-month period, some determination may be possible regarding rate of improvement and whether improvements are linear or possibly increase progressively as semantization, lexical bridging, and reduced anxiety transition the primarily monolingual EG to a more bilingual mode of classroom interaction. Ideally this will be visible in how scores chart on a line graph.

Ethical Considerations

When observing and recording real-world outcomes involving a selected populace, integrity is paramount to protect the subjects’ rights and maintain the integrity and validity of the research itself (Bhandari, 2021). As with all research, maintaining a standard of ethics in the process is vital for this project to provide trustworthy and accurate outcomes. Furthermore, with the involvement of multiple parties in collaboration during data collection, trust and accountability are also considerations (Resnik, 2020). The growing need for accurate reporting in

this arena due to the expansion of Western primary and secondary schools in Asia and the limited comparative study of this nature compound the importance of accuracy and trustworthiness.

Considerations During Intervention

The first concern with conducting research with children involves protecting them from potentially disruptive repercussions from research itself. This project falls under the exemptions contained in 45 CFR 46 §46.101 section (b); it satisfies all sections of statute one in that it takes place in a regular educational setting and is research into instructional strategies and effectiveness thereof (OHRP, 2021, subsection 46.101). Similar linguistic research has been done previously in EAL populations without noted disruptions or miseducative experiences. The primary, first-stage intervention of systematic L1 translation during class time has been beneficial to EAL students as it increases feelings of security, reduces stress levels, and improves cognition (Liu, 2008; Spahiu, 2013; Storch & Wigglesworth, 2003; Zulfikar, 2019). Virtually all literature provides some commentary regarding positive benefits regarding the use of L1 translation. While none specifically address the modified Interpreted Training Method to be employed in Q3, Ochi (2005), as cited in Ochi (2009), observed "A two-year implementation proved that there are a lot of benefits, bringing energy, vitality, changes, interaction and concentration into the classroom activities" (p. 124), suggesting that as is the case with other L1 interventions, the ITM has an inherently positive impact. Research data will provide evidence as to its impact on vocabulary acquisition.

The only potential harm that remains a possibility during the intervention is delayed acquisition of language skills that currently are not present. As noted previously, some language

researchers in the middle to the latter half of the 20th century believed that overreliance on L1 translation would delay the adoption of L2. More recently, researchers have promoted the opposite as being true (Liu, 2008; Spahiu, 2013; Storch & Wigglesworth, 2003; Zulfikar, 2019), or in some cases claimed the evidence is inconclusive, and more research is needed into lexical framing and the process by which L2 networks are constructed to overcome colloquial errors (Wolter, 2006). Even if some delay or reliance is shown to occur, some would appear to argue that the reduction in stress is a fair exchange (Zulfikar, 2019).

Considerations During Data Collection

Data collection was performed using common standardized assessments and longitudinal surveys completed by multiple teachers already working in an instructional capacity with both the experimental and control groups. None of the participating teachers' curriculum, pedagogy, or assessment methods of the participating teachers were modified. All data has been anonymized, meeting the standards from 45 CFR 46 §46.101 article (b) item (3)(i) that confidentiality of personally identifiable information is maintained through the research and thereafter (OHRP, 2021). Likewise, the standardized tests used for recording quantitative data were given the same protections as all private academic data, satisfying OHRP standards. Such data collection methods are unobtrusive and hold near-universal acceptance in academia. As noted by Liu (2008), "The use of language tests as tools to measure the EFL learners' literacy has been well justified in the literature" (p. 65). Potential future use of both quantitative and qualitative data will serve only to guide interventions for like-populations, and not for modifications of individual student learning plans of specific research participants.

Considerations of Researcher Bias

It is conceivable that a teacher-research would look for positive outcomes where there isn't any to be found, exaggerate the effectiveness of pedagogical methods, or otherwise seek to manipulate the data to create an appearance of success or failure that supports their bias. For this reason, data acquisition and checks and balances to ensure integrity were in place. The majority of data collection was quantitative, and as noted by Daniel (2020), "The issue of researcher being biased with either his data collection or data analysis will be highly eliminated when the researching is not in direct contact with the participants" (p. 94). While the researcher was providing direct instruction during the intervention, the quantitative data was generated and collected through computer-based implementation of standardized testing without researcher intervention.

The researcher is employed as the lead English teacher at the site. This project's research and intervention were conducted in concert with the L2 teacher-researcher and an L1 co-teacher conducting the L1 intervention in concert with prescribed methods. Access to direct translation and translated materials was uniform across the experimental group, with uniform considerations being given to fulfill student translation requests within the control group without implementing systematic translation method (or the ITM intervention). A standardized test provided quantitative data, and while standardized tests may contain cultural bias, both the EG and CG were racially, culturally, and linguistically homogeneous. Any extant testing bias was uniform across the entire research population. Qualitative data was provided by multiple subject area teachers and teaching assistants. The anonymized original instruments (surveys and tests) were archived securely as academic records in their identifiable form with anonymized copies made for any necessary public review.

Summary

Contemporary research has many educators rethinking the immersion-only method of teaching EAL students in an international context. Rapid globalization and emerging economies being populated by schools offering an international education in English has created classrooms filled with effectively monolingual students being taught in a language where they lack the proficiency to comprehend academic and literary vocabulary that is on their grade level. This research will examine the efficacy of using systematized L1 translation for vocabulary acquisition in a monolingual L2 classroom and compare it with the effectiveness of traditional peer scaffolding and differentiated instruction in a bilingual classroom. The experimental group (EG) consisted of 39 students in grade 6 with baseline Lexile scores of < 650, while the control group (CG) consists of 10 students in grade 7 with similar scores. The effectiveness of the intervention methods was measured through qualitative data contained in the results of periodic Lexile tests given to both the EG and CG, as well as through longitudinal surveys and observations from the teaching faculty who instruct both groups.

Finally, data collection procedures fell within guidelines established in 45 CFR 46. Controls were in place to ensure compliance with student privacy regulations and, most importantly, ensured that all student experiences of those in both the EG and CG were positive and educative.

Data Analysis and Results

Data Analysis Procedure

Data in the form of raw scores attained on the Lexile exams was compiled into spreadsheets. The spreadsheets were organized by class and grade, as well as the separate section isolating the ten students in the control group. The raw score on each Lexile exam was then

converted into the Lexile level represented by the score attained, and the grade level in which that Lexile is considered "proficient." In the case where there was grade-level proficiency overlap, the student was placed in the higher grade corresponding with the score attained. This enabled both individual student tracking and group tracking by calculating the group average and median scores. This organization enabled recorded data to be charted in a linear manner by group. Flaws in the effectiveness and accuracy of the data collected will be covered in the analysis section. Regardless of flaws and issues with accuracy due to student integrity discovered in the third and fourth Lexile tests, the quantitative data from the initial assessment and final assessment provides a clear representation of student improvement in both groups, while the middle tests show trends of improvement.

Survey questions completed by core subject teachers were given datapoint values for each observed category and performance level (Appendix A). The surveys were based on observation and the use of datapoints enabled the creation of graphs to provide more holistic view of each group's performance within the research body. By totaling point values from observation of student performance in each category during September at the beginning of the intervention, and observation at the end of February, a direct comparison can be made between the beginning and end of the observation period. The different subgroups of the study can also be compared quickly and easily. The qualitative surveys help to fill the gaps created by providing teacher observations of behaviors connected to cognition and understanding of L1.

Validity and Reliability

Quantitative results have some flaws in the third and fourth iteration of the Lexile exam due to student cheating. The first and fifth exam present accurate measures of student ability levels. There is simply no way around the obstacles presented by the pandemic and associated

restrictions in Vietnam. Additionally, after returning to campus there was a significant outbreak of Covid among the experimental group resulting in numerous gaps in the final test results. That said, the obvious progression made by many within the EG, consistency within the CG, and presence of 32/39 students in the EG provides enough data to consider the results sufficient to apply to the research questions.

The students were evaluated by four core subject area teachers using a numeric scale rating student behavior. These numbers were totaled, averaged, and present a consistent picture of changes in different student behaviors over the course of the research period. Three of the four teachers providing the feedback were native Vietnamese speakers who were better positioned to understand the thoughts and behaviors of the students with extreme language deficits. Surveys were completed individually without any discussion between participants to ensure unbiased feedback.

Quantitative Data Results

The quantitative data was entered into a spreadsheet divided into groupings by grade level, with the control group duplicated into a separate group (Appendix B). Raw scores from the Lexile exams, the corresponding Lexile level, and the grade level corresponding with "proficient" for the measured Lexile were included for reference. Obvious anomalies were removed from the data. Students with extreme language deficits, as well as several students encountering technical difficulties did not have baseline measurements in the exam given on 9/22/2021. In those instances, the 10/22 exam served to determine inclusion in the control group. Finally, there were numerous absences during the final exam administration. This was due to students in both groups acquiring Covid-19. Over the final three weeks of the research, 23 students tested positive for Covid-19 with many becoming ill. This undoubtedly had some

impact on the final test results. For instance, one of the strongest students in grade seven was present for the final exam before going home with Covid-19 an hour later. The student's score dropped significantly from the earlier result and was likely a result of the illness.

EG baseline exam analysis revealed that the students in grade six had an average Lexile of 347.5, with an associated average grade placement of second grade. The two highest measured Lexile levels in the EG placed those students in grade five. The median grade level was grade 2. The first six months of learning was completed online due to Covid-19 restrictions in Vietnam. A large increase in scores was noticeable between the second and third exam. With researchers unable to directly monitor student actions during the exams, some students violated instructions and used Google Translate as an aid to understanding the texts. The final exam given was conducted in a supervised classroom setting. This resulted in a visible degrease on the aggregate EG line graph (Appendix C).

The initial comparison between the two groups shows an almost identical increase in average Lexile level, with the EG only outpacing the CG by 10 points. The median scores (Appendix D) reveal a different result, with the EG having a 110-point increase compared to a statistically insignificant increase in the CG. The increase in the average score within the CG was driven by two highly motivated students showing dramatic improvement, whereas the CG increase was spread across the population (Appendices E and F).

Qualitative Data Results

After collection of teacher feedback was completed and entered in a spreadsheet with assigned datapoints applied, the experimental and control groups were evaluated by percentage of improvement based upon teacher observation. In raw improvement, the ten students in the CG lagged behind the EG by a significant margin, with a 20% increase in datapoints compared to the

34% improvement in performance metrics based on teacher observations. The category with the most significantly improved differential in behavior for both groups was in compliance with classroom rules such as remaining on camera during online learning, while the EG saw a significant improvement in verbal response when called on.

Interviews conducted with core-subject teachers following the intervention were both affirmational as to the efficacy of the use of translation and the impact of motivation. English (me), math, and science subject area teachers agreed that the EG had shown greater improvement than grade seven. The social studies teacher noted that while grade six had shown a greater improvement, the overall difference in some cases could be connected to motivation. This was particularly true when the EG was compared to strictly the ten students serving as a control group. Those students appeared to lack intrinsic motivation and received little extrinsic motivation outside of school. This possibility was considered prior to the study and the surveys completed by the Vietnamese co-teachers was conducted to get a more quantifiable measurement of improvement in areas connected to motivation. One potential benefit of L1 use as an intervention for L2 acquisition is an increase in motivation. Grade 7 showed only marginal improvements for responding verbally when called upon, with increases of .7, .12, .25, .58, .5, .59, .44, and 1.0 observed by the co-teachers. The 1.0 evaluation was of the higher performing grade seven group in the in English class with peer scaffolding. Comparatively, according to feedback the EG showed improvements of 1.05, .7, .55, .65, 1.55, 1.0, .52, and .48. Feedback from the foreign teachers suggested that the gap was significantly larger when applied to just the EG.

Discussion and Conclusion

The research findings were not entirely unexpected, however, there were several surprises in terms of student responses to pedagogy. In the population there was a high degree of unpredictability due to most of the students having never studied in a Western-style school, and the fact that many had not attended school (either in-person or at all) for almost two years.

Outcome Analysis

The first research question was, "What impact does L1 translation have on Lexile level in middle school EAL students in a linguistically homogeneous L2 classroom." During the study there were several variables that affected the acquisition of vocabulary. Online learning requires students to have either intrinsic motivation and/or the support of parents providing extrinsic support. Several students within the study had neither. Nevertheless, both the median and average Lexile rose 140 points during the research period. While the intermediate data may be somewhat inaccurate due to issues discussed previously, the baseline and final numbers are accurate representation of student levels. The measured Lexile levels of students absent from the final testing were marginally higher than the final EG average and would have had minimal impact on the final scores. Comparatively, the CG median showed virtually no change, with averages being dramatically affected by two highly motivated learners. Based on Lexile increases across the entire population it appears that L1 intervention is beneficial.

The second research question was, "What impact does L1 translation have on acquiring and applying L2 grammar conventions in the same population?"

Ultimately this question requires more time to answer than the research period provided. Student English levels were so low that many students were below conversational level, and the online learning environment hindered the ability to fully assess this. Based on foreign teacher

observations, the EG showed notable improvement over the CG in both motivation and performance, while the overall impact of social constructivist scaffolds in grade seven appeared to have promoted collaboration and willingness to volunteer for spoken activities. The survey data supports this as well. To summate, the grade six EG appears to have gained substantially in understanding of direct communication, while grade seven students have become more willing to utilizing L2 without prompting. The extended online learning time due to Covid-19 restrictions in Vietnam prevented the study from moving into the reverse translation phase where students would translate to English, so it is impossible to do more than speculate on the impact that would have had on speaking.

The third question was, “What impact (if any) does L1 translation in ELA have on student behavior and performance in other core courses?”

Teacher observations indicated that the EG showed greater improvement than the general G7 population in virtually every category, lending credence to other studies that have indicated L1 intervention may improve behavior by reducing stress levels. The most significant observation regarding student behavior improvement related to L1 intervention is the increase in students volunteering for spoken activities. G7 showed no increase and the control group showed minimal increase. Improvement in spoken activities were noted in virtually all segments of the experimental group. The CG showed a significant improvement and outpaced the EG in the teacher behavioral observation. This reinforces the importance of social learning and peer modeling, the primary methodology behind the CG instruction.

As mentioned previously, Teachers interviewed identified the EG as having made more significant progress in understanding and performance in most measured behavioral metrics, with the notable exception being volunteering for spoken activities. In activities requiring

comprehension of spoken language such as following instructions and adhering to classroom rules, the EG outpaced the CG. This correlates directly with comprehension increases measured in the Lexile testing. As noted previously, the median Lexile score in the CG was virtually static during the intervention period.

Learning Themes

In a new international school with an imbalance of EAL students with significant language deficiencies rapid acquisition of vocabulary and comprehension is extremely beneficial to curriculum, instruction, stakeholder satisfaction, and the well-being of all involved in the educational process. Ultimately, improving learner outcomes was the purpose of this research. However, there is no magic bullet. Performance gains were restricted in large part due to the challenges presented by the extended period of online instruction. If the opportunity to repeat this research is presented, conducting it over the same period with in-person instruction would be valuable. Applying reverse-translation methods, as well as integrating more group and spoken assignments over the second phase of the intervention would be ideal.

Implications

With the online learning and Covid-19 related issues such as shortened instructional periods online, blended use of social constructivist and Vygostkian methods was impossible. The restrictions provided a scenario where tools could be isolated to view their effectiveness separately. Blending social constructivist methods with systematic translation will provide a "best of both worlds" approach. Teacher feedback validated this belief as the grade seven group with greater emphasis on group and peer intervention is notably more verbal, while the EG showing greater growth in comprehension.

Conclusion

The outcomes show an undeniable connection between an increase in comprehension, understanding, and improvements in behavior through the implementation of L1 translation, as well as a propensity to promote learner comfort. Anecdotally, teacher-student relationships appeared to be stronger. The language barrier not being directly addressed can at times create awkwardness and anxiety in students. Students visibly relax and have “ah-hah” moments when receiving L1 translation. Done systematically with repetition, evidence shows that they retain and build vocabulary by as they add new language into their Lexical range. These benefits spilled over into other classes, with student behaviors and performance improving.

Benefits of social components and peer intervention cannot be ignored. Grade seven showed greater growth in student initiative, particularly among those possessing higher levels of motivation. The control group and grade seven benefitted from having additional interaction through group work and peer modeling, which appeared less effective for improvement of comprehension than translation.

Results seem to indicate that both methods should be used together, strengthening comprehension and reinforcing usage through interaction and modeling. The final two month of this study was to include this aspect to evaluate combined efficacy; however, the global pandemic made this impossible. In-person learning, originally slated to begin when school resumed in January was pushed back until February 14. Two weeks after classes began in-person 18 students in the EG and two in the CG contracted Covid-19, as did four foreign teachers and two Vietnamese co-teachers. Based on the differences in areas of improvement, it is likely that the combination of interventions is the ideal, and exclusion of either method results in a less effective intervention.

REFERENCES

Bhandari, P. (2021, October 18). *A guide to ethical considerations in research*. Scribbr. https://www.scribbr.com/methodology/research-ethics/

Brown, D. H. (2000). *Teaching by Principles, Second Edition* (2nd ed.) [E-book]. Pearson ESL.

Daniel, E. (2016). The Usefulness of Qualitative and Quantitative Approaches and Methods in Researching Problem-Solving Ability in Science Education Curriculum. *Journal of Education and Practice*, *7*(15), 91–100. https://files.eric.ed.gov/fulltext/EJ1103224.pdf

Dewey, J. (1897). My Pedagogic Creed. *School Journal*, *54*, 77–80. http://playpen.meraka.csir.co.za/~acdc/education/Dr_Anvind_Gupa/Learners_Library_7_March_2007/Resources/books/readings/17.pdf

Financial Supervisory Commission, R.O.C. (2019). *Taiwan's 2030 goal to become a bilingual nation(2019–01-11)-Financial Supervisory Commission*. https://www.fsc.gov.tw/en/home.jsp?id=253&parentpath=0,4,212,252#:%7E:text=In%20December%20of%202018%2C%20the,the%20country's%20overall%20national%20competitiveness.

Liu, J. (2008). L1 Use in L2 Vocabulary Learning: Facilitator or Barrier. *International Education Studies*, *1*(2). https://doi.org/10.5539/ies.v1n2p65

Mathewson, G. C. (1988). Test Review: Standardized Reading Inventory (SRI). The Reading Teacher, 41(4), 462–465. http://www.jstor.org/stable/20199813

OCHI, Y. (2009) The Role of L1 in Facilitating L2 Production. *Interpreting and Translation Studies, 1,* 123-140. http://jaits.jpn.org/home/kaishi2009/pdf/10-ochi.pdf

Office for Human Research Protections (OHRP). (2021, June 16). *Pre-2018 Requirements*. HHS.Gov. https://www.hhs.gov/ohrp/regulations-and-policy/regulations/regulatory-text/index.html#46.101(b)(2)

Resnik, D. (2020). *What Is Ethics in Research & Why Is It Important?* National Institute of Environmental Health Sciences. https://www.niehs.nih.gov/research/resources/bioethics/whatis/index.cfm

Spahiu, I. (2013). Using Native Language in ESL Classroom. *IJ-ELTS: International Journal of English Language & Translation Studies*, *1*(2), 243–248. http://www.eltsjournal.org/

Storch, N., & Wigglesworth, G. (2003). Is There a Role for the Use of the L1 in an L2 Setting? *TESOL Quarterly*, *37*(4), 760. https://doi.org/10.2307/3588224

Tsai, L. H. (2020). *Has Educational Reform Succeeded in Taiwan? 4500-Percent Rise in Cram Schools over Past 30 Years*. CommonWealth Magazine. https://english.cw.com.tw/article/article.action?id=2639

Wolter, B. (2006). Lexical Network Structures and L2 Vocabulary Acquisition: The Role of L1 Lexical/Conceptual Knowledge. *Applied Linguistics*, *27*(4), 741–747. https://doi.org/10.1093/applin/aml036

Zulfikar, Z. (2019). RETHINKING THE USE OF L1 IN L2 CLASSROOM. *Englisia Journal*, *6*(1), 42. https://doi.org/10.22373/ej.v6i1.2514

Appendix A

Survey					
	Circle One:				
Student name	Never	Rarely	Occasionally	Regularly	Always
Complies with class rules (camera on during online learning, punctuality, established procedures).	0	1	2	3	4
Completes classwork	0	1	2	3	4
Responds verbally when called on	0	1	2	3	4
Volunteers for spoken activities (reading, asking/answering questions, etc)	0	1	2	3	4
Submits completed homework assignments	0	1	2	3	4
Teacher Observations: How would you describe this student's academic and behavioral progress during this month? Are there any milestones you would attribute to an improvement in language understanding?					

Appendix B

	student	student	student	student	student	student	student	student	student	student	student	student	student	student	student	student	student	student	student	student	Average	Datapoints Total
Q1 complies with rules	2	2	1	2	0	1	1	0	0	4	3	0	2	4	2	1	3	1	2	4	1,85714286	
Current Complies with rule	3	3	2	3	1	3	3	1	1	3	2	2	3	4	3	3	2	2	2	4	2,57142857	
Q1 Completes Classwork	3	4	2	3	2	2	2	0	0	4	3	0	1	4	4	2	3	2	4	4	2,52380952	
Current Completes Classwo	3	4	1	2	1	3	3	1	1	4	2	1	2	4	4	3	3	1	4	4	2,61904762	
Q1 Responds verball when	1	3	1	2	1	1	1	0	0	4	3	0	2	4	2	2	3	2	3	4	2,04761905	
Current Responds Verbally	2	4	1	2	2	2	2	2	1	4	3	0	3	4	3	2	3	1	4	4	2,52380952	
Q1 Volunteers for spoken a	1	4	0	1	0	1	1	0	0	4	1	0	1	4	2	1	4	0	1	4	1,61904762	
Current Volunteers for spo	0	3	0	1	0	2	2	0	0	4	1	0	2	4	2	1	3	0	1	4	1,61904762	
Q1 Submits homework Ass	3	4	2	3	2	3	2	0	0	4	3	0	2	4	4	2	3	2	4	4	2,57142857	
Current Submits homewor	3	4	1	2	1	3	3	2	1	4	2	1	1	4	4	3	2	2	4	4	2,61904762	
Q1 Total	10	17	6	11	5	8	7	0	0	20	13	0	8	20	14	8	16	7	14	20	19	10,6190476
Current Total	11	18	5	10	5	13	13	6	4	19	10	4	11	20	16	12	13	6	15	20	20	11,952381
Q1 complies with rules	3	4	2	3	1	2	4	1	1	4	3	0	3	4	4	4	4	2	4	4	2,9047619	
Current Complies with rule	3	4	2	3	1	3	4	2	2	4	3	0	3	4	4	4	4	3	4	4	3,0952381	
Q1 Completes Classwork	3	4	2	3	2	2	3	0	0	4	1	0	2	4	4	4	4	2	4	4	2,66666667	
Current Completes Classwo	3	4	2	4	3	2	3	1	1	4	2	0	2	4	4	4	4	2	4	4	2,9047619	
Q1 Responds verball when	3	4	2	3	2	3	4	1	0	4	3	0	3	4	4	4	4	2	4	4	2,95238095	
Current Responds Verbally	3	4	3	4	4	4	4	3	1	4	3	1	4	4	4	4	4	3	4	4	3,47619048	
Q1 Volunteers for spoken a	0	3	0	3	0	0	0	0	0	4	0	0	0	4	3	2	4	0	1	4	1,52380952	
Current Volunteers for spo	0	4	0	2	0	0	1	0	0	4	0	0	0	4	3	3	4	0	1	4	1,61904762	
Q1 Submits homework Ass	2	4	1	3	1	1	3	0	0	4	2	0	2	4	4	3	3	2	4	4	2,42857143	
Current Submits homewor	2	4	2	3	2	2	3	1	1	4	3	0	3	4	4	4	3	3	4	4	2,85714286	
Q1 Total	11	19	7	15	6	8	14	2	1	20	9	0	10	20	19	17	19	8	17	20	40	13,4285714
Current Total	11	20	9	16	10	11	15	7	5	20	11	1	12	20	19	19	19	11	17	20	20	13,952381
Q1 complies with rules		1	0	2	2	1	1	0	0	4	4	0	4	4	4	2	4	1	4	4	4	2,3
Current Complies with rules		3	3	4	3	2	3	0	4	4	1	4	4	4	3	4	3	4	4	4		3,2
Q1 Completes Classwork		3	2	3	4	2	2	0	0	4	2	0	4	4	3	3	4	2	3	4	4	2,65
Current Completes Classwork		4	3	4	4	3	2	2	2	4	4	1	4	4	4	4	4	3	3	4	4	3,35
Q1 Responds verball when called on		3	2	3	3	2	2	0	0	4	2	0	4	4	1	3	4	2	4	4	4	2,55
Current Responds Verbally when called		4	4	4	4	3	3	2	0	4	3	2	4	4	3	4	4	3	4	4	4	3,35
Q1 Volunteers for spoken activities		1	0	0	1	0	1	0	0	4	2	0	4	4	0	4	4	1	1	4	4	1,75
Current Volunteers for spoken activities		1	0	0	4	2	3	0	0	4	3	0	4	4	1	4	4	1	3	4	4	2,3
Q1 Submits homework Assignments		4	4	4	3	2	2	0	1	4	4	0	4	4	4	3	4	2	2	4	4	2,95
Current Submits homework Assignment		4	4	4	3	4	3	1	2	4	4	0	4	4	4	4	4	3	3	4	4	3,35
Q1 Total	0	12	8	12	13	7	8	0	1	20	14	0	20	20	12	15	20	8	14	20	40	12,5714286
Current Total	0	16	14	15	19	15	13	8	4	20	18	4	20	20	16	19	20	13	17	20	20	14,8095238
Q1 complies with rules	1	3	0	1	1	1	1	0	4	3	1	3	4	3	4	4	0		4	3		2,1
Current Complies with rule	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		4	4		4
Q1 Completes Classwork	2	3	1	2	1	1	2	0	1	4	2	0	4	4	3	2	2		2	2		2
Current Completes Classwo	4	4	2	2	2	2	4	3	2	4	2	2	4	4	4	2	4		2	2		2,9
Q1 Responds verball when	2	4	0	2	1	1	0	1	0	4	3	1	4	4	4	4	4		4	4		2,45
Current Responds Verbally	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4		4	4		4
Q1 Volunteers for spoken a	0	3	0	0	0	0	0	0	0	3	0	0	0	4	1	0	2	0		1	1	0,75
Current Volunteers for spo	0	3	0	0	0	0	4	0	0	3	0	0	0	4	1	0	2	0		1	1	0,95
Q1 Submits homework Ass	2	3	1	2	1	1	2	0	1	4	2	0	2	4	3	2	1	3		4	3	2,05
Current Submits homewor	4	4	2	4	4	4	4	2	2	4	4	1	4	4	4	3	3	3		3	3	3,3
Q1 Total	7	16	2	7	4	4	5	2	2	19	10	2	13	20	14	12	13	7	0	15	27	9,57142857
Current Total	16	19	12	14	14	14	20	13	12	19	14	11	16	20	17	13	17	14	0	14	14	14,4285714
																					Total Data Points	Average
Survey Total Q1	28	64	23	45	28	27	34	4	4	79	46	2	51	80	28	28	28	28	28	28	711	33,8571429
Survey Total Current	38	73	40	55	48	53	61	34	25	78	53	20	59	80	38	38	38	38	38	38	983	46,8095238

6.2	student	student	student	student	student	student	student	student	student	student	student	student	student	student	student	student	student	student	student	student		
Q1 complies with rules	0	1	1	1	1	0	0	0	0	1	0	0	0	0	2	4	2	2	0	1		0,8
Current Complies with rule	2	3	3	2	3	2	2	2	2	3	3	3	1	2	3	4	4	3	2	3		2,6
Q1 Completes Classwork	3	1	3	3	4	2	4	1	1	3	1	1	4	0	3	3	4	4	2	3		2,5
Current Completes Classwo	2	3	3	3	4	3	4	3	3	3	3	4	4	3	3	4	4	4	3	4		3,3
Q1 Responds verball when	1	1	4	4	4	1	1	0	1	4	0	0	4	0	2	4	4	4	4	4		2,35
Current Responds Verbally	1	1	4	4	4	3	3	1	2	4	2	2	4	2	3	4	4	4	4	4		3
Q1 Volunteers for spoken a	0	0	4	4	4	0	0	0	0	4	0	0	3	0	2	4	4	2	4	1		1,8
Current Volunteers for spo	0	0	4	4	4	0	0	0	0	4	0	0	3	0	2	4	4	2	4	1		1,8
Q1 Submits homework Ass	3	1	4	4	4	4	4	1	0	3	1	1	4	0	3	3	4	4	1	4		2,65
Current Submits homewor	2	3	3	3	4	4	4	3	3	2	3	3	4	4	3	3	4	4	2	4		3,25
Q1 Total	7	4	16	16	17	7	9	2	2	15	2	2	15	0	12	18	18	16	11	13		10,1
Current Total	7	10	17	16	19	12	13	9	10	16	11	11	16	12	14	18	20	17	15	16		13,95
Q1 complies with rules	4	1	4	4	3	2	4	4	0	4	2	4	4	1	4	4	4	3	3	4		3,15
Current Complies with rule	4	3	4	4	4	3	4	4	3	4	3	4	4	3	4	4	4	4	3	4		3,7
Q1 Completes Classwork	3	1	4	4	4	2	4	2	0	4	2	4	4	1	4	4	4	3	2	4		3
Current Completes Classwo	3	2	4	4	4	3	4	3	2	4	2	4	4	1	4	4	4	3	3	4		3,3
Q1 Responds verball when	3	1	4	4	4	2	4	2	1	4	1	4	3	1	4	4	4	3	3	4		3

Appendix B (continued)

Current Responds Verbally	3	3	4	4	4	4	4	3	2	4	3	4	4	3	4	4	4	3	3	4	3,55	
Q1 Volunteers for spoken a	2	0	4	4	4	0	2	0	0	4	0	4	2	0	4	4	4	0	2	4	2,2	
Current Volunteers for spo	2	0	4	4	4	0	2	0	0	4	0	4	2	0	4	4	4	0	4	4	2,3	
Q1 Submits homework As	2	1	4	4	3	3	4	2	0	3	2	4	2	2	3	4	3	3	2	4	2,75	
Current Submits homewor	3	3	4	4	3	3	4	3	1	4	3	4	3	3	4	4	4	4	3	4	3,4	
Q1 Total	14	4	20	20	18	9	18	10	1	19	7	20	15	5	19	20	19	12	12	20	14,1	
Current Total	15	11	20	20	19	13	18	13	8	20	11	20	17	10	20	20	20	14	16	20	16,25	
Q1 complies with rules	0	1	4	4	3	3	1	4	1	4	1	3	2	3	4	2	4	2	1	4	2,55	
Current Complies with rule	0	2	4	4	3	3	3	4	3	4	3	4	3	4	4	3	4	3	3	4	3,25	
Q1 Completes Classwork	0	1	4	4	3	2	2	4	1	4	2	4	2	2	4	1	4	2	2	4	2,6	
Current Completes Classw	0	2	4	4	4	4	3	4	2	4	3	4	3	3	4	3	4	3	2	4	3,2	
Q1 Responds verball when	0	2	4	4	3	2	1	4	0	4	1	3	2	2	4	2	2	1	2	4	2,35	
Current Responds Verbally	0	3	4	4	4	3	2	4	1	4	2	4	3	3	4	3	3	3	3	4	3,05	
Q1 Volunteers for spoken a	0	0	4	4	0	0	0	1	0	4	1	2	1	1	4	1	1	1	0	4	1,45	
Current Volunteers for spo	0	0	4	4	2	1	1	3	0	4	1	3	1	2	4	3	3	1	2	4	2,15	
Q1 Submits homework As	0	2	4	4	2	2	2	4	1	4	2	3	2	2	4	1	3	2	1	4	2,45	
Current Submits homewor	0	3	4	4	3	3	4	4	2	4	3	4	3	3	4	3	4	4	2	4	3,25	
Q1 Total	0	6	20	20	11	9	6	17	3	20	7	15	9	10	20	7	14	8	6	20	11,4	
Current Total	0	10	20	20	16	14	13	19	8	20	12	19	13	15	20	15	18	14	12	20	14,9	
Q1 complies with rules	2	1	4	3	3	0	1	1	2	4	1	2	3	1	3	4	3	2	3	3	2,3	
Current Complies with rule	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
Q1 Completes Classwork	2	0	1	2	1	1	1	1	0	2	1	2	1	0	1	2	1	0	1	1	1,05	
Current Completes Classw	2	1	1	4	2	2	2	1	1	3	2	1	2	1	2	3	3	2	2	3	2	
Q1 Responds verball when	3	2	4	4	4	3	2	1	2	4	3	3	4	2	4	4	3	2	4	3	3,05	
Current Responds Verbally	4	4	4	4	4	3	4	3	4	4	3	3	4	4	4	4	4	4	4	4	3,8	
Q1 Volunteers for spoken a	0	0	1	3	0	0	0	0	0	3	0	0	1	0	0	4	0	0	2	1	0,75	
Current Volunteers for spo	0	0	1	4	0	0	0	0	0	3	0	0	1	0	1	4	0	0	2	1	0,85	
Q1 Submits homework As	4	0	3	3	1	3	2	1	0	2	2	3	2	2	2	1	2	2	3	2	2	
Current Submits homewor	4	2	3	4	3	3	2	1	2	3	2	1	2	2	2	3	3	3	3	3	2,55	
Q1 Total	11	3	13	15	9	7	6	4	4	15	7	10	11	5	10	15	9	6	13	10	9,15	
Current Total	14	11	13	20	13	12	12	9	11	17	11	9	13	11	13	18	14	13	15	15	13,2	
																					Total Datapoints	
Survey Total Q1	32	17	69	71	55	32	39	33	10	69	23	47	50	20	61	60	60	42	42	63	895	44,75
Survey Total Current	36	42	70	76	67	51	56	50	37	73	45	59	59	48	67	71	72	58	58	71	1166	58,3

7.1	student	student	student	student	student	student	student	student	student	student	student	student	student	student	
Q1 complies with rules	0	0	0	0	1	4	1	0	0	1	0	0	1	1	0,64285714
Current Complies with rule	3	1	2	2	3	4	4	3	2	3	2	1	2	3	2,5
Q1 Completes Classwork	3	0	1	0	4	4	4	0	0	3	2	4	2	3	2,14285714
Current Completes Classw	4	3	3	3	4	4	2	3	3	4	3	4	3	3	3,28571429
Q1 Responds verball when	0	1	1	0	4	4	4	1	0	1	2	4	2	4	2
Current Responds Verbally	2	2	2	2	4	4	4	3	2	3	3	4	3	4	3
Q1 Volunteers for spoken a	0	0	0	0	2	4	1	0	0	0	0	4	0	4	1,07142857
Current Volunteers for spo	0	0	0	0	3	4	1	0	0	0	0	4	0	4	1,14285714
Q1 Submits homework As	4	0	1	1	4	4	3	0	0	3	2	4	2	3	2,21428571
Current Submits homewor	4	3	3	3	4	4	2	3	3	4	2	4	3	3	3,21428571
Q1 Total	7	1	3	1	15	20	13	1	0	8	6	16	7	15	8,07142857
Current Total	13	9	10	10	18	20	13	12	10	14	10	17	11	17	13,1428571
Q1 complies with rules	1	2	2	2	3	4	3	1	2	4	3	4	4	4	2,78571429
Current Complies with rule	2	3	3	3	4	4	4	2	3	4	4	4	4	4	3,42857143
Q1 Completes Classwork	1	3	2	2	3	4	3	1	2	3	3	4	4	4	2,78571429
Current Completes Classw	2	3	3	3	4	4	3	2	3	3	3	4	4	4	3,21428571
Q1 Responds verball when	1	3	2	2	3	4	3	1	2	3	2	4	4	4	2,71428571
Current Responds Verbally	3	3	3	3	4	4	3	2	4	3	3	4	4	4	3,35714286
Q1 Volunteers for spoken a	0	0	0	0	3	4	2	0	0	1	1	4	2	4	1,5
Current Volunteers for spo	0	0	0	0	4	4	2	0	0	1	2	4	3	4	1,71428571
Q1 Submits homework As	1	2	2	1	3	4	2	1	1	4	2	4	3	2	2,28571429
Current Submits homewor	3	3	3	2	4	4	3	2	3	4	3	4	4	4	3,28571429
Q1 Total	4	10	8	7	15	20	13	4	7	15	11	20	17	18	12,0714286
Current Total	10	12	12	11	20	20	15	8	13	15	15	20	19	20	15
Q1 complies with rules	2		2	3	3	4	4	2	1	4	1	4	3	3	2,76923077
Current Complies with rule	3		4	4	4	4	4	3	3	4	3	4	4	4	3,69230769
Q1 Completes Classwork	2		3	3	2	4	4	2	2	4	2	4	3	3	2,92307692
Current Completes Classw	4		4	4	3	4	4	3	3	4	3	4	4	4	3,69230769
Q1 Responds verball when	2		3	3	2	4	4	2	2	4	2	4	3	3	2,92307692
Current Responds Verbally	3		4	3	3	4	4	3	3	4	3	4	4	4	3,53846154
Q1 Volunteers for spoken a	1		1	2	1	4	4	1	1	4	1	4	2	3	2,23076923
Current Volunteers for spo	2		3	3	2	4	4	2	3	4	3	4	4	4	3,23076923
Q1 Submits homework As	3		3	3	2	4	4	2	2	4	2	4	2	3	2,92307692
Current Submits homewor	4		4	4	2	4	4	3	3	4	2	4	4	4	3,53846154
Q1 Total	10	0	12	14	10	20	20	9	8	20	8	20	13	15	12,7857143
Current Total	16	0	19	18	14	20	20	14	15	20	14	20	20	20	16,4285714
Q1 complies with rules	2	1	2	2	2	4	4	4	3	4	4	2	3	4	2,92857143
Current Complies with rule	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

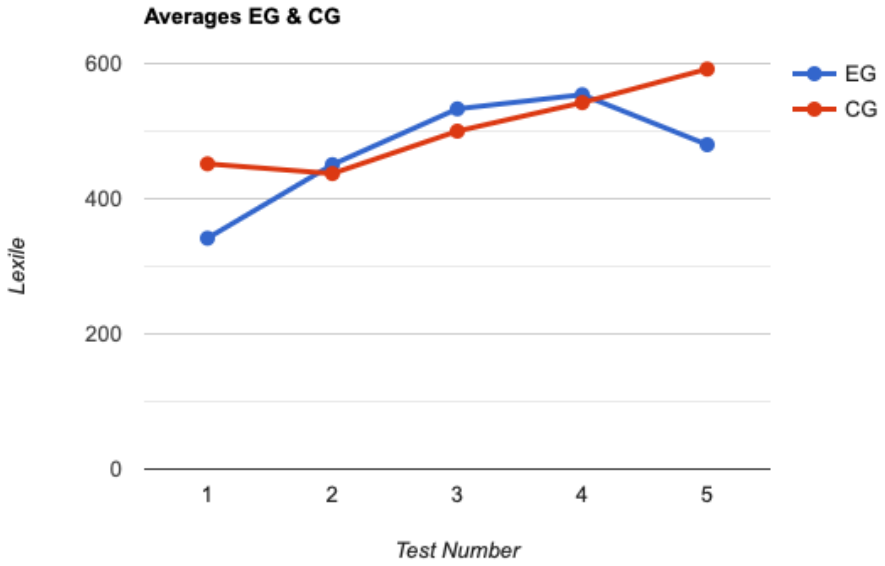
Appendix B (Continued)

Q1 Completes Classwork	1	2	1	1	1	4	4	1	1	2	3	3	1	3	2	
Current Completes Classw	3	3	3	3	3	4	4	3	3	3	4	4	3	4	3,35714286	
Q1 Responds verball when	3	3	3	3	3	4	4	3	3	4	4	4	4	4	3,5	
Current Responds Verbally	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
Q1 Volunteers for spoken a	0	0	0	0	1	4	2	0	0	2	3	2	0	4	1,28571429	
Current Volunteers for spo	1	1	1	1	1	4	2	0	0	3	4	2	0	4	1,71428571	
Q1 Submits homework As:	2	1	2	3	1	4	4	0	0	3	3	3	1	2	2,07142857	
Current Submits homewor	3	3	3	3	3	4	4	3	3	4	4	4	3	4	3,42857143	
Q1 Total	8	7	8	9	8	20	18	8	7	15	17	14	9	17	11,7857143	
Current Total	15	15	15	15	15	20	18	14	14	18	20	18	14	20	16,5	
															Total Datapoints	Average
Q1 Total	29	18	31	31	48	80	64	22	22	58	42	70	46	65	626	44,7142857
Current Total	54	36	56	54	67	80	66	48	52	67	59	75	64	77	855	61,0714286

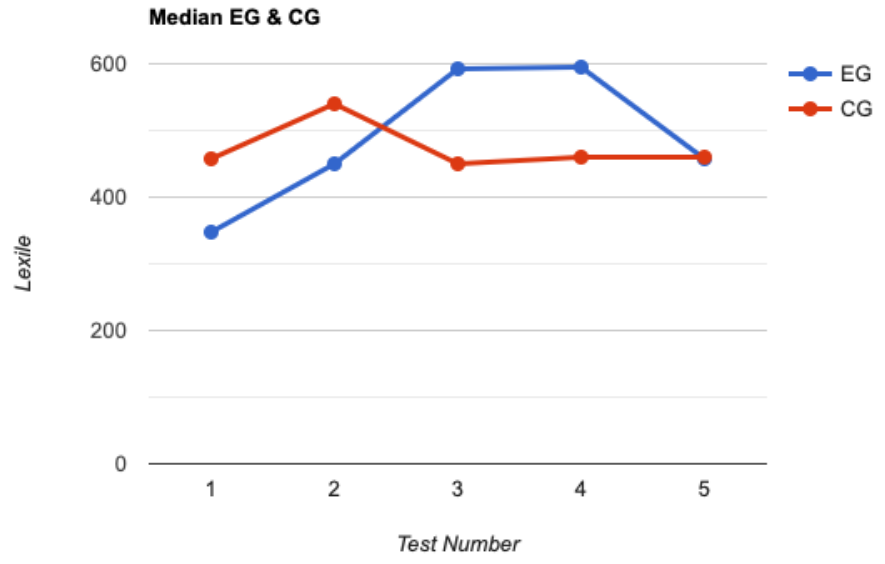
7.2	student	student	student	student	student	student	student	student	student	student	student	student		
Q1 complies with rules	0	0	4	0	2	0	1	0	3	0	2	0	1	
Current Complies with rule	2	2	4	1	4	0	3	2	4	0	4	0	2,16666667	
Q1 Completes Classwork	4	4	4	1	4	0	1	1	4	0	4	0	2,25	
Current Completes Classw	4	4	4	3	4	2	3	2	3	1	4	0	2,83333333	
Q1 Responds verball when	4	4	4	0	4	0	1	0	4	0	4	0	2,08333333	
Current Responds Verbally	4	4	4	1	4	1	3	2	4	1	4	0	2,66666667	
Q1 Volunteers for spoken a	4	2	4	0	1	0	0	0	4	0	1	0	1,33333333	
Current Volunteers for spo	4	2	4	0	1	0	0	0	4	0	1	0	1,33333333	
Q1 Submits homework As:	4	4	4	1	4	0	1	1	4	0	4	0	2,25	
Current Submits homewor	4	4	4	3	4	1	3	3	3	1	4	0	2,83333333	
Q1 Total	16	14	20	2	15	0	4	2	19	0	15	0	8,91666667	
Current Total	18	16	20	8	17	4	12	9	18	3	17	0	11,8333333	
Q1 complies with rules	4	4	4	2	4	0	4	2	4	0	4	0	2,66666667	
Current Complies with rule	4	4	4	3	4	1	4	3	4	0	4	0	2,91666667	
Q1 Completes Classwork	4	4	4	2	4	0	4	2	4	0	4	0	2,66666667	
Current Completes Classw	4	4	4	3	4	0	4	2	4	0	4	0	2,75	
Q1 Responds verball when	4	4	4	2	4	0	4	2	4	1	4	0	2,75	
Current Responds Verbally	4	4	4	3	4	1	4	3	4	1	4	0	3	
Q1 Volunteers for spoken a	4	2	4	0	4	0	1	0	4	0	4	0	1,91666667	
Current Volunteers for spo	4	2	4	0	4	0	1	0	4	0	4	0	1,91666667	
Q1 Submits homework As:	4	4	4	1	3	1	3	1	4	0	4	0	2,41666667	
Current Submits homewor	4	4	4	3	4	2	4	2	4	0	4	0	2,91666667	
Q1 Total	20	18	20	7	19	1	16	7	20	1	20	0	12,4166667	
Current Total	20	18	20	12	20	4	17	9	20	1	20	0	13,4166667	
Q1 complies with rules	4	4	4	1	4	0	4	3	4	0	4	0	2,66666667	
Current Complies with rule	4	4	4	2	4	1	4	3	4	2	4	0	3	
Q1 Completes Classwork	4	4	4	1	4	0	4	3	4	1	4	0	2,75	
Current Completes Classw	4	4	4	2	4	1	4	4	4	2	4	0	3,08333333	
Q1 Responds verball when	4	4	4	0	4	0	4	3	4	1	4	0	2,66666667	
Current Responds Verbally	4	4	4	1	4	0	4	4	4	1	4	0	2,83333333	
Q1 Volunteers for spoken a	4	4	4	0	4	0	4	3	4	0	4	0	2,58333333	
Current Volunteers for spo	4	4	4	0	4	0	4	4	4	0	4	0	2,66666667	
Q1 Submits homework As:	4	4	4	1	4	1	4	3	4	1	4	0	2,83333333	
Current Submits homewor	4	4	4	3	4	3	4	3	4	2	4	0	3,25	
Q1 Total	20	20	20	3	20	1	20	15	20	3	20	0	13,5	
Current Total	20	20	20	8	20	5	20	18	20	7	20	0	14,8333333	
Q1 complies with rules	4	3	4	2	4	2	3	2	4	0	4		2,90909091	
Current Complies with rule	4	4	4	4	4	4	4	4	4	4	4		4	
Q1 Completes Classwork	2	3	3	1	3	1	2	1	3	0	2		1,90909091	
Current Completes Classw	3	4	4	3	4	3	3	3	4	3	3		3,36363636	
Q1 Responds verball when	4	4	4	3	4	3	4	3	4	0	4		3,36363636	
Current Responds Verbally	4	4	4	4	4	4	4	4	4	4	4		4	
Q1 Volunteers for spoken a	3	2	4	1	2	0	0	0	4	0	1		1,54545455	
Current Volunteers for spo	3	2	4	1	2	1	1	1	4	0	1		1,81818182	
Q1 Submits homework As:	2	3	4	3	4	2	2	2	2	1	3		2,54545455	
Current Submits homewor	4	4	4	4	4	3	3	3	4	3			3,6	
Q1 Total	15	15	19	10	17	8	11	8	17	1	14		12,2727273	
Current Total	18	18	20	16	18	15	15	15	20	14	12		16,4545455	
													Total Datapoints	Average
Q1 Total	71	67	79	22	71	10	51	32	76	5	69		553	46,0833333
Current Total	76	72	80	44	75	28	64	51	78	25	69		662	55,1666667

Control Grou	1179
Control Grou	1517
CG raw impr	338
GC improven	0,28668363
Experimental	1606
Experimental	2149
EG raw impr	543
EG improven	0,3381071

Appendix C



Appendix D



Appendix E

Grade 6 Lexile Test Results

Grade 6 (EG	9/22/2021	Lexile	grade	10/22/2021	Lexile	grade	12/03/2021	Lexile	grade		1/26/2022	Lexile	grade	03/07/2022	Lexile	Grade
Student	26	485	3	31	580	3	33	635	4		30	575	3	39	740	5
Student	20	375	2	29	540	3	35	675	4		40	760	5	37	700	5
Student	18	340	2	25	465	2	33	635	4		36	680	4	16	330	2
Student	15	280	1	30	560	3		560	3		30	575	3	20	375	2
Student	31	580	3	35	675	4	28	520	3		37	700	5	32	610	4
Student	20	375	2	20	375	2	27	505	3		30	575	3	22	440	2
Student	13	240	1	31	580	3	31	580	3		15	310	2	26	510	3
Student	36	700	5	40	835	6	40	835	6		42	800	6	30	575	3
Student	25	465	2	20	375	2	24	450	2		23	460	2			
Student			1	17	320	2	18	340	2		19	390	2			
Student	13	240	1		240	1	12	240	1							
Student		0	1	11	0	1	18	340	2		10	0	1	9	0	1
Student	19	355	2	28	520	3	24	450	2		18	370	2	15	310	2
Student		0	1	8	0	1	8	0	1		16	330	2	14	290	1
Student	25	465	2	33	625	4	39	795	5		37	700	5	32	610	4
Student		0	1	10	0	1		0	1		13	0	1	16	330	2
Student		0	1	10	0	1		0	1		7	0	1	13	240	1
Student	27	505	3	37	730	5	38	760	5		49	1010	9	43	825	6
Student				41	880	7	32	605	4					27	525	3
Student	15	280	1	13	240	1	10	240	1		17	350	2	17	350	2
Student	14	260	1	26	485	2	29	540	3		17	350	2	15	310	2
Student	23	430	2	39	795	5	40	835	6		46	905	8	18	370	2
Student	16	300	1	10	0	1	18	340	2		18	370	2	27	525	3
Student	9	0		14	260	1	15	300	2		25	495	2	14	290	2
Student	24	450	2	31	580	3	39	795	5		31	595	3	38	720	5
Student		300	1	19	355	2	13	240	1		18	370	2	22	440	3
Student	11	0		18	340	2	30	560	3		32	630	4	18	370	2
Student	10	0		20	375	2	35	675	4		37	700	5	24	475	2
Student	33	625	4	33	625	4	34	650	4		29	560	3	40	760	5
Student	34	650	4	38	760	5	34	650	4		37	700	5			
Student	38	760	5	42	880	6	43	880	7		41	780	5	44	850	7
Student	13	240	1	21	395	2	34	650	4		37	700	5	26	510	3
Student	29	540	3	33	625	4	36	700	5		36	680	4			
Student	23	430	2	23	430	2	37	730	5		38	720	5	32	610	4
Student		260	1	15	280	1	11	240	1		15	310	2	16	330	2
Student	32	605	4	36	700	5	34	650	4		38	720	5	31	595	3
Student	14	260	1	18	340	2	40	835	6		39	740	5	18	370	2
Student	14	260	1	19	355	2	34	650	4		43	825	6			
Student	25	465	2	24	450	2	35	675	4		38	720	5	21	425	2
Student	23	460	2	24	450	2	30	560	3		31	595	3	31	595	3
Average	21,5	341,578947	2	24,9230769	450,5	2,75	28,9459459	533	3,35		29,3421053	553,947368	3,65789474	24,7941176	479,558824	2,94117647
Median	21,5	347,5	2	24	450	2	33	592,5	3,5		31	595	3	23	457,5	2,5

Appendix F

Control Group Lexile Results

CG	9/22/2021	Lexile	grade	10/22/2021	Lexile	grade	12/03/2021	Lexile	grade	1/26/2022	Lexile	grade	03/07/2022	Lexile	Grade
Student	23	430	2	32	605	4	28	520	3	30	575	3	34	645	4
Student	24	450	2	31	580	3	33	625	4	40	760	5	39	740	5
Student	27	505	3	11	0	1	16	300	2	21	425	2	23	460	2
Student	16	300	2	29	0	3	24	450	2	14	290	1	18	370	2
Student	25	465	2	32	605	4	32	605	4	42	800	6	41	780	5
Student	30	560	3	37	730	5	41	880	7	45	875	7	45	875	7
Student				8	0	1		anomaly		18	370	2			
Student				22	410	2	14	260	1	14	290	1	21	425	2
Student				25	465	2	23	430	2	26	495	2	22	440	2
Student					anomaly		23	430	2	12	0	1	23	460	2
Average	24,1666667	451,666667	2,33333333	25,2222222	377,222222	2,77777778	26	500	3	26,2	542,222222	3	29,5555556	591,875	3,44444444
Median	24,5	457,5	2	29	465	3	24	450	2	23,5	460	2		460	2